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THE AIRCRAFT INDUSTRY PREPARES FOR THE FUTURE

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TESTIMONY PRESENTED BY REPRESENTATIVES OF THE AERONAUTICAL CHAMBER OF COMMERCE OF AMERICA, INC., TO THE WAR CONTRACTS SUBCOMMITTEE OF THE COMMITTEE ON MILITARY AFFAIRS, UNITED STATES SENATE.

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THE AIRCRAFT INDUSTRY
PREPARES FOR
THE FUTURE

*AERONAUTICAL CHAMBER OF COMMERCE OF AMERICA, INC.,
SHOREHAM BUILDING, WASHINGTON 5, D. C.*

Aircraft Industries of America, inc.

AERONAUTICAL CHAMBER OF COMMERCE OF AMERICA, INC.

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INTRODUCING THE INDUSTRY'S VIEWPOINT

By Eugene E. Wilson

NATION
FACES THE
CHALLENGES
OF PEACE

The aircraft manufacturers appreciate this opportunity to appear before your Committee. You and your colleagues in the Houses of Congress are performing a service vital to the nation. You are planning for the demobilization of a nation which has proved its capacity to organize for war, and is now preparing itself to face the challenges of peace.

UNPREPARED
FOR VICTORY

While all of us continue to concentrate our efforts on waging a victorious war, and the aircraft industry demonstrates its part in that process by its production achievements, we are confronted by the fact—recently pointed up by Bernard M. Baruch—that the nation still is months away from being prepared to meet the great adjustments that will come on that unknown “X Day” when one of our enemies is defeated.

MILITARY
PRODUCTION
STILL
PARAMOUNT

We emphasize that while we are preparing for peace, we are intensifying military production. We are designing, developing, testing, and producing new military models. We will continue to devote our best efforts to these ends as we reach war's climax.

BEGINNING
TO PREPARE
FOR PEACE

Plans for converting the aircraft industry to peacetime operations must give due weight to the fact that we were unprepared for World War I and for the peace which followed. We were better prepared, but still not adequately prepared, for World War II, and we are just beginning to prepare for the peace which will follow this war. While devoting its production efforts to war materials, the industry thanks you for this invitation to assist the Committee in its planning for the transition.

THE
PRINCIPLES OF
AIR POWER

The aircraft manufacturers have evolved some principles of *AIR POWER*. We believe these principles are pertinent to the work of this Committee, since they form a framework

within which the nation's largest wartime industry may contribute after the transition both to the economic welfare of our nation and to the maintenance of peace. Events on world-wide battlefronts are proving *AIR POWER* as a dominant force in modern warfare.

We can keep peace by having adequate air forces of such strength and in such state of readiness as to preclude, together with other branches of the armed services, a successful assault on our country or its possessions. We must not only have large air forces but superior aircraft.

We can keep it by facilitating the orderly and economic expansion of domestic and international air transport and of private, or personal flying.

We can keep it by training the youth of the country to understand the air as a vast new world for transportation, and to fly the airplanes which use that world.

The keeping of the peace as outlined above will necessitate a strong aircraft manufacturing industry. Possession of *AIR POWER*, not its use, is the greatest safeguard for peace.

AIR POWER
AFFECTS BOTH
NATION AND
AIRCRAFT
WORKERS

Our testimony will be presented in the light of our suggested *AIR POWER* policy. This policy is pertinent to the present hearings of your Committee because it sets the framework for solving one major industry's demobilization problems. It deals with those problems in terms of both broad national interests and the individual interests of the workers in that industry. There are about 2,100,000 aircraft workers. Of those, 1,112,650 work for basic aircraft manufacturers, about a million work for 162,366 subcontractors and vendors.

AIRCRAFT
INDUSTRY
IMPORTANT
IN NATION'S
ECONOMY

The aircraft industry, today producing three-quarters as much as all the United States industries combined in 1940, is a major part of the national economy. This economy must prepare itself to stand the shock of transitional employment for the greater part of 18,000,000 people engaged directly and indirectly in war production, 11,000,000 members of the armed forces, and nearly 2,000,000 in war-related government services. This involves the adjustment of an estimated

\$21,300,000,000 annual aircraft production in 1944. The avoidance of a violent economic adjustment for a majority of 2,100,000 aircraft workers will be of great benefit to the nation.

**THE STEPS TO
AIR POWER**

During and after this adjustment, we must not only maintain adequate air forces if we are to achieve *AIR POWER*, but we must advance the design of all aircraft and produce new designs. We must train combat crews and ground personnel. We must extend our meteorological and navigational knowledge and facilities. We must improve our engines and our instruments. We must increase our landing facilities and we must extend our airways. We must provide for research. We must improve our materials and simplify our manufacturing procedures. We must maintain our jigs and tools. We must keep adequate facilities in readiness. We must continue to employ as many as possible of our thousands upon thousands of skilled workers so that our nation will not lose their contribution to *AIR POWER*.

**INDUSTRY'S
OWN INTERESTS
INVOLVED**

In addition, we have our own honest interest in staying in business on a sound basis, to make a reasonable profit while efficiently serving the postwar aircraft needs of the nation.

STATEMENT OF AIR POWER POLICY

By Eugene E. Wilson

**WHY A POLICY
FOR
AIR POWER?**

The objective of an *AIR POWER* policy is "to provide for the common defense, promote the general welfare and secure the blessings of liberty to ourselves and our posterity." We believe that historic, economic and all other considerations make such a policy imperative.

**WHY
CONSERVE OUR
AIR POWER?**

The details of the American *AIR POWER* policy are of importance to the present hearings because your Committee is not just acting as an executor liquidating a great war. Such

a procedure would require disposal of all assets as well as all liabilities. The work of the Committee covers the broader range of a trustee who retains assets and manages them for the beneficiaries.

The conservation of *AIR POWER's* assets will pay dividends to the nation for generations to come.

What are these assets?

RETAIN
ABILITY TO
PRODUCE

They are the planes which have bombed, strafed, torpedoed, and shot out of the skies the enemy aircraft in combat. More than that, they are the "know-how" which made these planes possible. The vital character of military air force is now established beyond the shadow of a doubt, and we should not heedlessly destroy the ability to produce such a potent weapon.

AIR FORCES
HELPED MAKE
INVASION
A SUCCESS

The success of the invasion of Europe hinged as much as upon any other factor on the ability of the air forces—working and fighting in conjunction with other services—to assure freedom of communications on land, sea and in the air for us, and to deny that freedom to the enemy. We cannot afford to throw such advantages away by lagging behind in world aeronautical development either in time of war or of peace.

NAVAL
AIR POWER
CONTROLS
SEA LANES

Naval *AIR POWER* has demonstrated in the Pacific that it controls the sea lanes. Planes have proved themselves not alone as new weapons, but also as a means for bringing old and new weapons together more effectively.

WE MUST
HAVE
AIR POWER

It is inconceivable that we should now or in the future abandon such control and through indifference allow another nation or nations to outstrip us and eventually dominate us. In the light of what has been accomplished in aircraft manufacture, it is not unreasonable to predict that huge bombers will be able to attack an objective half way around the globe

and return non-stop. We will not be allowed, in the future, the few hours of grace which follow a declaration of war. *AIR POWER* will strike like lightning. Announcement of hostilities will come later. We must have *AIR POWER* to discourage and forestall such sneak attacks.

**AIR TRANSPORT
IS A WEAPON**

While combat *AIR POWER* has proved itself, we must remember that American transport, too, has developed tremendously its utility as a war weapon. Private domestic airlines have expanded to operate vast overseas services under contracts with the Air Transport Command. The Army and Navy Air Transport Commands serve distant fronts in this global war.

**COMPLEX
OPERATIONS
MADE POSSIBLE**

Rapid transportation of troops and key men have made possible complex operations—needed materials have been rushed to all fronts—war necessities have been flown back to our factories—wounded have been brought back to this country for proper treatment. The personal type airplane has made its contribution, serving as eyes for the ground forces, as the transportation vehicle for combat officers, and as an aerial ambulance.

**AIR POWER
ALSO WORKS
FOR PEACE**

AIR POWER has served so well in war that there is danger of its wartime accomplishments obscuring its peacetime significance. It is worth reminding ourselves that *AIR POWER* works for peace as well as for war, that air transportation—commercial and personal—is the heart of *AIR POWER*. Its backbone is the aircraft industry. Its sinews are the Army and Navy air forces.

**NOT A BURDEN
ON THE PEOPLE**

With the coming of peace, some may protest that we cannot afford to maintain such *AIR POWER* after the war. This objection, however, loses sight of the fact that *AIR POWER*, properly administered, need not be a burden upon the people, tending to depress their standard of living but can, on the other hand, become a profitable investment.

AIR POWER
IN
WORLD WAR I

For proof, let us turn back a few pages of history. The first important stage in the growth of American *AIR POWER* was during World War I. The development of our aviation at that time was thrust upon us by great external forces. Before that war, we did not regard the airplane as something to fight with; we thought of it as a tool for peacetime pursuits. At that time, surface transportation, and principally international sea transportation, was all-important, as it had been for centuries.

NO MILITARY
PLANES
IN 1917

When we entered the war in April, 1917, we were without military airplanes or even designs for them. Although we borrowed liberally from the designs of our Allies, although we worked hard to produce designs of our own, and although we moved energetically to produce military aircraft by American volume production methods, few American airplanes were in combat.

UNPREPARED
FOR THE
ARMISTICE

Similarly, we were not prepared for the armistice which came in November, 1918. We had no adequate plans for terminating war contracts. We had no definite program or facilities for disposition of surplus goods and plants. The result came close to a debacle when many aircraft companies failed and those which escaped collapse were producing only a few small orders.

THE
MORROW
BOARD

In 1925, the vigorous criticisms of Brig. Gen. William E. Mitchell and a mounting public demand resulted in the creation of the "Morrow Board" by President Coolidge. This was composed of representatives of the armed forces, the aeronautical engineering profession, Congressional bodies and the public.

WHAT THE
BOARD
RECOMMENDED

The recommendations of this board, embodied by Congress in the Air Corps Act of 1926, resulted in the appointment of an Assistant Secretary for Air in the Departments of War, Navy and Commerce. The Board concluded that our national

security required a strong air force and that at its base there must be a sound private aviation industry whose technological and manufacturing progress was to be made possible by an extended program of procurement.

THE ROAD TO AIR POWER

The Morrow Board and its recommendations might well have started the United States on the road to real *AIR POWER*. Not all its recommendations were followed. Some were. Sometimes they were followed consistently and sometimes intermittently. But even this prepared the basis for America's aircraft industry to be technologically prepared for World War II. We had the designs, if not the plants and the production.

AIRCRAFT INDUSTRY IN WORLD WAR II

Fortunately, orders from nations which were later our Allies enabled us to take our designs, build up our plants, and develop our production so that at the time America entered World War II we were in a position where we could supply aircraft to our Allies, instead of borrowing from them, and at the same time build up our own nation's air forces.

CONTROLLING THE SEA LANES

The moral of this is future *AIR POWER* preparedness.

Control of communication by sea is a counterpart to *AIR POWER*. Captain Mahan's work, "The Influence of Sea Power Upon History," showed the effect of sea power in successfully waging war and in promoting prosperity during peace. The cooperation of American and British sea power brought the constructive benefits of a peaceful interchange of products and ideas throughout the world.

THREE CHALLENGES FACED IN 25 YEARS

Three times during the past 25 years this beneficent control of the seas has been challenged by the enemies of democracy—twice by the Germans with submarines and recently by the Japanese with naval *AIR POWER*. But Allied *AIR POWER*, in conjunction with greatly expanded naval forces, has met these menaces. Today American aviation—in operation, engineering, design and production—stands preminent. Con-

tinued supremacy in the air will bring progress, prosperity, and security in peace after it has helped win victory in war.

It will be the cheapest possible insurance against recurring wars, with their horrible loss of life, tremendous costs and ultimate lowering of living standards.

SEA AND
AIR POWER
COMPARED

Pursuing further the comparison of sea and *AIR POWER*, the former consists of five basic elements: the Navy, the Merchant Marine, the shipbuilding industry, strategic bases and a national seafaring tradition. *AIR POWER* is composed of comparable elements, including: Army and Navy air forces, commercial air transport, and private air transportation, the aircraft manufacturing industry, strategic air bases, and an air-minded public.

AIR POWER
ASSETS
MUST BE
RETAINED

While sea power has a long established history of building and protecting nations, the corresponding effects of *AIR POWER* are only now being brought to light. If *AIR POWER* continues to be used properly in our behalf, there can be no doubt of the ultimate results. Proficiency attained in any given field, whether by nations, communities or commercial organizations, is held by an unbroken continuity in its utilization. A break in the chain can lose the heritage. The aircraft industry offers invaluable assets in its management, technological and manufacturing personnel and facilities. But unless positive measures are taken to retain a strong nucleus of these national assets, the American aircraft manufacturing industry could be rendered ineffective in its future ability to serve the American people.

ADVANTAGES
OF PENT-UP
CIVILIAN
DEMAND

There is one fundamental difference between aircraft and many lines of industry that have temporarily entered some phase of war production. Whereas many plants designed for making civilian goods have converted to aircraft components—and can reconvert, when the war ends, to their normal activities—aircraft manufacturers are not in this fortunate posi-

tion. The automobile industry, as an example, will go back to the production of motor cars with a huge pent-up demand waiting. On the other hand, if the need for continuing *AIR POWER* is ignored, aircraft manufacturing companies will face a diminishing demand.

PEOPLE AND
AIRCRAFT
INDUSTRY
PARTNERS

Our views on the disposition of postwar surplus of airplanes are given later; also our suggestions on the handling of cut-backs, employment deceleration, and the development of markets for new types of civilian airplanes. But beyond these problems in the immediate future—and national defense for all time—the American people and the aircraft industry have a long-range partnership in planning the future of domestic and international air transport. There is a historic and, to the public, a profitable precedent for such a partnership to be found in the development of railroad and automobile transportation, with their great benefits to the nation and to individuals.

DIVIDENDS
FROM
AIR POWER

An investment in *AIR POWER* will pay rich dividends in future security, economic progress, employment, and in the broad advance of our civilization. These benefits will come not only through relative military security but also through the elimination of frontiers and the promotion of international friendship and understanding. Future peacetime aviation will make the world smaller and people separated by thousands of miles, and differences in languages and customs, close neighbors.

NEW
LEGISLATION
RECOMMENDED

Maintenance of *AIR POWER* is the master need as we move the aircraft industry from war to peace. Technological development through competitive industry is the key to air power. In light of the proven decisive character of *AIR POWER*, we recommend new legislation restating as national policy the principle of advancing technological development of aviation through competitive private industry.

THE GEORGE-MURRAY BILL (S-1730)

By Harry Woodhead

BILL GIVES PROGRAM FOR POSTWAR ADJUSTMENT

The George-Murray Bill (S-1730) provides a national program for demobilization and postwar adjustment. Of the four titles of the bill, the ones on

(1) *Industrial Demobilization and Reconversion*
and

(2) *Manpower Demobilization and Reemployment*
bear on the aircraft industry.

QUESTIONS ASKED OF THE AIRCRAFT INDUSTRY

The Committee requested the aircraft industry to present before the War Contracts Subcommittee its viewpoints on the following eight questions concerned with the industrial and human aspects of demobilization.

1. *To what extent is it necessary to achieve better coordination between the cutback program of the Navy Department and that of the War Department? How can this best be achieved?*
2. *Once it is decided to cut back a given program by a given amount, what yardsticks should be used in deciding which companies are cut and how much each company is cut?*
3. *What should be the policy governing advance notice of cutbacks for (a) the company? (b) the subcontractors? (c) the employes? and (d) other government agencies?*
4. *What provision should be made for employes who are released from wartime aircraft production? through unemployment compensation? through re-training? through transportation to other localities?*
5. *How can production cutbacks in aircraft best be integrated and synchronized with the development of other types of war production or of civilian aircraft production?*

6. *What are the important steps that the government and industry can take now to promote the rapid development of civilian aircraft production?*
7. *What principles should be followed in handling Government-owned aircraft factories, aircraft and airfields?*
8. *What plans should be made for a postwar national defense program for the aircraft industry? through research and development? through standby capacity? through other methods?*

INDUSTRY'S
REPLIES
AS SPECIFIC
AS POSSIBLE

In our answers to the Committee's questions, we are being as specific as possible. Some of the problems reflected in the Committee's questions still are in relatively early stages of study, both by government and industry. In many cases, industry cannot make plans with any degree of finality until it knows what are to be the national policies and how the agencies of government shall administer those policies. As the work of your Committee proceeds, and as some of the uncertainties are resolved, you may wish to ask the aircraft manufacturers to appear again with their facts, conclusions and recommendations.

A close interrelationship exists in many of the Committee's questions, and we have, for clarity, arranged our answers in four groups:

Group I. *Manpower Demobilization*

(Question 4. In addition, this topic cuts across the subject of all other questions.)

Group II. *Termination Methods and Problems*

(Questions 1, 2, 3 and part of 5.)

Group III. *Surplus Disposal and Reconversion*

(Part of question 5 and questions 6 and 7.)

Group IV. *Postwar National Defense Program and the Aircraft Industry*

(Question 8.)

PROBLEMS OF
EMPLOYMENT
UPPERMOST

The problem of employment will be foremost in the minds of all Americans when this war ends. We can store excess machinery, but we can not store surplus human beings. Recognizing the importance of a successful readjustment of millions of men and women to the postwar economy, we first shall give our answers to the Committee's questions concerning demobilization of manpower and treat the other groups later.

MANPOWER DEMOBILIZATION

By Harry Woodhead

Answers to Committee Question 4:

What provision should be made for employes who are released from wartime aircraft production

1. *through unemployment compensation?*
2. *through re-training?*
3. *through transportation to other localities?*

In addition, this question cuts across all other topics.

DEMOBILIZA-
TION A
NATIONAL
PROBLEM

The aircraft industry wants full employment for everybody, but it realizes there will be a difficult transition period before this aim can be achieved. Demobilization will be a national problem.

UNEMPLOYMENT
INSURANCE
ESSENTIAL TO
MANPOWER
DEMOBILIZA-
TION

The industry is in thorough agreement with the principle of adequate unemployment insurance as an essential to orderly manpower demobilization and reemployment. The industry realizes that expansion of unemployment benefits will ultimately mean an additional burden to all industry. As part of the national economy, the aircraft industry will be glad to share this burden with all other industries. Payments should be far enough below the average wage scale to provide a safeguard against voluntary unemployment at government expense.

**LESSENING THE
DANGERS OF
MASS
UNEMPLOYMENT**

The sum of industry recommendations made below in answer to Senator Murray's other questions will permit a more orderly return to peacetime production and, therefore, a considerable lessening of the dangers of sudden mass unemployment.

**MANY AIRCRAFT
WORKERS MUST
BE RE-TRAINED**

Many of the workers presently employed by the aircraft industry have had no previous industrial experience. They have been trained for their specific jobs by the aircraft industry. Re-training will be necessary for many of those who go into other industries. We believe that the new employer or suitable educational agencies should assume the responsibility of training these workers for the new jobs. This would prevent the disappointments and waste of money resulting from training people for jobs which do not exist.

**TRANSPORTA-
TION
PROVISIONS
ENDORSED**

In many aircraft plants it has been necessary to bring workers from great distances. We endorse that part of the George-Murray bill providing transportation of these workers to other jobs or back to their bona fide residences at government expense.

**OTHER AIDS IN
DEMobilizing
MANPOWER**

(a) War contractors should supply prompt and detailed information on reductions in employment to government employment offices and other interested agencies.

(b) Such agencies should provide full information concerning new employment opportunities and conditions to released employes.

(c) War contractors and government employment offices should collaborate to assist employes in finding new employment opportunities quickly.

**MANY AIRCRAFT
WORKERS
AMONG THOSE
TO BE
REALLOCATED**

The aircraft industry expanded its production of war weapons at the government's request. For a large amount of this production there will be no use and no demand after the war is over. The industry thus represents a large share of the general problem of the reallocation of labor that will be necessary before maximum employment can be achieved for the country as a whole. This demobilization problem is not that of the aircraft industry alone but of the national economy as a whole. The industry can contribute to the solution of the problem by wholehearted cooperation in the activities previously described.

**INDUSTRY'S
FINANCIAL
POSITION
AGGRAVATES
ITS PROBLEMS**

The financial position of the aircraft industry aggravates its problems in converting from wartime to peacetime operations. Only a few years ago, the industry ranked a lowly 44th in importance to our national economy. It was a youthful industry, striving to advance. It was mushroomed out of all proportion to its former status. Aircraft building was small business; our outlook is for a return to the status of relatively small business.

**WARTIME
EXPANSION
EXCEEDED RISE
IN WORKING
CAPITAL**

This tremendous expansion has taken place under the demands of war. During normal peacetime growth, aircraft makers gradually would have acquired financial resources necessary to sustain increased volume. Working capital has increased but under wartime controls has not by any means kept pace with responsibilities and obligations imposed by a greatly expanded production.

**PROFITS ON
SALES OF
AIRCRAFT
LOWEST
AMONG WAR
INDUSTRIES**

The rate of net profits on sales volumes in aircraft is the lowest of any industry engaged in war production. In 1943, the percentage of net income to sales for 24 major aircraft and parts manufacturers was 1.8, according to the National City Bank of New York.

Following is a comparison of war industry profits compiled by the National City Bank of New York:

NET PROFITS ON SALES, 1943

Non-Ferrous Metals	9.0%
Petroleum Products	6.8%
Automobile (including aircraft sales) ..	3.2%
Railway Equipment	3.1%
Iron & Steel Industry	2.8%
AIRCRAFT AND PARTS	1.8%

SUBSTANTIAL PART OF WHAT PROFITS THERE WERE STILL IN THE BUSINESS

The profits reported by the aircraft manufacturers during the war period are to a large extent bookkeeping figures. The ultimate profits, if any, of the industry during the war can only be determined when all final settlements have been made. A very substantial part of the bookkeeping profits are still in the business, largely in the form of inventories and other properties which will be subject to drastic shrinkage in values. Only a small part has been paid out in dividends. But in spite of this conservative practice, working capital is meager in relation to the obligations of the business. It is safe to say that the entire net current assets of the industry would not equal one month's operating costs at present production rates.

The industry, while eager to do its full share during the conversion period, may have difficulty in meeting its present obligations, to say nothing of assuming additional burdens.

TERMINATION METHODS AND PROBLEMS

By Harry Woodhead

Answers to Committee Questions:

1. *To what extent is it necessary to achieve better coordination between the cutback program of the Navy Department and that of the War Department? How can this best be achieved?*
2. *Once it is decided to cut back a given program by a given amount, what yardsticks should be used in deciding which companies are cut and how much each company is cut?*

3. *What should be the policy governing advance notice of cutbacks for (a) the company? (b) the subcontractors? (c) the employes? and (d) other government agencies?*
5. *How can production cutbacks in aircraft best be integrated and synchronized with the development of other types of war production? (Answered sub 4.)*

**CONTRACTS
SHOULD BE
TERMINATED
PROMPTLY**

The principles set forth in the Murray Contract Termination Act are sound and workable, if properly administered. The industry believes that, once the need for given types of aircraft and equipment ends, contracts should be terminated promptly. This is sound policy from the taxpayer's standpoint and it is sound policy from the industry's point of view. We don't want to produce planes to fill warehouses.

Termination must be orderly and planned to assure the uninterrupted continuation of remaining government orders.

**WHAT A
TERMINATION
PROGRAM
SHOULD
ACCOMPLISH**

An orderly and planned termination program will accomplish:

- (a) Continuation of planes of new design, either in production or projected, if in the opinion of the Army or Navy they are needed for the maintenance of *AIR POWER*.
- (b) Continuation of development of experimental types which will contribute to advances in the sciences.
- (c) Complete termination of types of which there are excess quantities and of types which are no longer of tactical value.

EMPLOYMENT
SHOULD BE
PROVIDED

A planned and orderly termination plan must

- (a) Prevent precipitous and continued wholesale unemployment.
- (b) Provide employment in non-war industries in proportion to decreased employment in war industries.

FULLY
COORDINATE
ARMY AND
NAVY
PROGRAMS

These are the industry's replies to question 1 of the George-Murray Committee:

It is necessary to continue and extend coordination between Army and Navy cutback programs to the *fullest* extent. If a program is to be decreased by one branch of the service, it might prove that the other would have business to fill up the manufacturing facilities so released without serious interruption of production. The Army and Navy not only should be in accord on their programs but should continue close contact with other government agencies and the aircraft manufacturers. Thus, when cutbacks appear probable, these agencies and the manufacturers will have the maximum possible time to adjust their schedules.

COLLABORA-
TION BETWEEN
THE SERVICES
AND INDUSTRY

Extension of the policy of collaboration between the services and the industry would have many advantages. It would cut the cost to the government of excess inventories of parts work in process and raw materials, by permitting the manufacturer to schedule his work and his purchases more closely with the revised program. Both the employer and the employe would benefit by more realistic planning, closer scheduling of labor supply and material requirements, and advantages in subcontracting. What the industry needs now is the same unity of planning and administration applied to demobilization as the Aircraft Production Board brought to production scheduling.

WHAT ABOUT
CUTBACKS?

Many interrelated, and in some cases, conflicting facts need to be considered before a just decision can be made on cut-

backs. The weight of the different criteria influencing such a decision will vary greatly with individual cases. It is therefore impossible to make a conclusive statement. The overriding consideration should be the safeguarding of the creative design staffs of the pioneer aircraft companies. We can further state several major factors which should be taken into consideration.

1. *The aircraft industry has a relatively small postwar market awaiting it. Aircraft cutbacks should, therefore, be effective first for those temporary aircraft manufacturers such as the automobile industry, which have postwar markets awaiting for them.*
2. *Problems of the creator of the original design should be given consideration in the decision as to which manufacturer is going to be cut back first—the licensee or the basic manufacturer.*
3. *Present production status of manufacturers concerned.*
4. *Local manpower situation.*
5. *Overall costs of the products to the government.*
6. *Manpower utilization.*
7. *Meeting of production schedules.*
8. *Contributions to progress of aviation.*
9. *Needs of the aircraft industry to prepare for postwar development and production.*
10. *Orders for aircraft that are becoming obsolete should be cut back before orders for aircraft of more advanced design and of greater tactical usefulness.*

**DETERMINE
AIRPLANES
NEEDED**

The primary consideration for all cutbacks during the war has been and should be the earliest possible determination as to how many airplanes of each model will be required by the Army and Navy.

CONSIDER
CYCLE OF
MANUFACTURE

The aircraft manufacturing cycle, from raw material to finished work, is from 60 to 120 days. Unless the government gives cutback notice to the manufacturers at least that far in advance, it will receive only semi-finished parts of indeterminate value and with attendant contract settlement problems. Such 60 to 120 day advance notice will give the government complete aircraft instead of partially processed materials and miscellaneous parts which may or may not be usable. In the long run this should prove sounder economy for the government.

Adequate notice will help both government and industry in the solution of two other difficult problems. The first is the loss of workers hard to replace. The second is the evaluation of work in process. These are serious handicaps to speedy termination of contracts.

TIME TO
NOTIFY SUB-
CONTRACTORS

When prime contractors are given formal notice of cutbacks, prime contractors are now required to advise subcontractors *promptly*, with the instruction to them that this notice be passed on through the various tiers of subcontracting. As a matter of principle as well as good business, all suppliers affected by a cutback program should be advised as far ahead of time as possible.

ADVANCE
NOTICE TO
EMPLOYEES

It is the policy of the aircraft industry to give advance notice to employes of any cutback which may cause a reduction in manpower. Employes should be advised by the manufacturer as soon as revised personnel requirements can be computed. The speed with which the government notifies the employer of cutbacks is of vital importance. If advance notice is inadequate, many workers return immediately to their civilian pursuits and are permanently lost to

essential industry. This loss goes up to 80 per cent of all women workers. If adequate notice is given, half of these workers can be saved for essential industry. It is important that no statement whatever be released before it is definite and can be stated clearly. Uncertainties are sure to destroy morale and cause disruption of the production process.

**INFORM OTHER
GOVERNMENT
AGENCIES**

All interested agencies, such as the War Production Board and the War Manpower Commission, should be informed promptly of projected cutback programs. It is important, however, that no agencies take any action or release any information affecting the company or the community in which it operates until the agency is fully informed as to the long-range plans of the company concerned.

**AVOID
INTERFERENCE
WITH FUTURE
PRODUCTION**

Cutbacks should not interfere with future production of types of aircraft still in demand by the military. An example will illustrate the complexity of the problem. There are at present three manufacturers producing a certain type of bomber. One of these three manufacturers has a new model coming in to replace the one presently produced. If this manufacturer's production were to be cut, labor would leave the area of production and would not be available for the new model except at great expense of money, time and efficiency. In this specific case, the local manpower situation should have a decisive weight. The involved nature of the problem makes it essential to have the industry's viewpoint fully represented at the earliest time at which cutbacks are being considered.

**AIRCRAFT
PLANTS NOT
READILY
CONVERTIBLE**

The average aircraft plant is not readily convertible for non-aircraft types of war production. It is also highly unlikely that any emergency will arise during which the facilities and skills of the basic aircraft industry would be more useful in producing anything but airplanes. Should this need arise,

however, the aircraft industry stands ready to make its resources available for war production of any type.

SURPLUS DISPOSAL AND RECONVERSION

By Harry Woodhead

Answers to Committee Questions:

5. *How can production cutbacks in aircraft best be integrated and synchronized with the development of other types of civilian aircraft production?*
6. *What are the important steps that the government and industry can take now to promote the rapid development of civilian aircraft production?*
7. *What principles should be followed in handling Government-owned aircraft factories, aircraft and airfields?*

Civilian aircraft manufacture should be started at the earliest possible moment which will not interfere with military needs. Before discussing the Committee questions referring to surplus disposal and reconversion, we wish to point to the major handicap under which the industry is laboring in all its planning activities; namely, the lack of any information on the size of the postwar air force of the United States, and the nation's technological program for aviation development. While determination of the former may necessitate awaiting world developments, the latter certainly can be determined now. Without such information, all planning—both for military and for civil aviation—lacks a sound basis. Preparation and release of such information is an essential prerequisite to industry planning.

GIVE OPPORTUNITY TO BUY OR LEASE U. S.-OWNED FACILITIES

Each company operating a government factory should be given an opportunity to buy or lease the factory at reasonable terms for use. If, after a reasonable period of time, the manufacturer has not made arrangements for using the government factory, the government should then be free to dispose of it to others. If aircraft factories cannot be used by either the original occupant or others, the factories, if suitable, should be kept under private management as standby plants for defense purposes. Aircraft factories should be

available for use by their present occupants as warehouses for surplus materials acquired by the government as a result of contract terminations. Under no circumstances should the plants be operated by the government.

**U. S.-OWNED
PLANES ALL
OVER THE
WORLD**

After the war, the government will own many different types of aircraft for which it will have no use. These aircraft will be in all parts of the world. They will be in different conditions varying from new to badly worn. The policies of disposal for these aircraft are of major importance to the future of the industry.

**SURPLUS
AIRCRAFT A
MAJOR ASSET**

The industry commends the Harvard Business School on its excellent report entitled "Disposal of Surplus Aircraft and Major Components Thereof." It heartily endorses many of the principles which the report sets forth. It is the theme of the report that surplus aircraft constitute a major asset that can be used to promote production and employment in the postwar aircraft industry by broadening the demand and enlarging the replacement market and creating overhaul and sales work.

**CONVERSION
CREATES
LITTLE
EMPLOYMENT**

The industry appreciates the opportunity for employment created by the need for conversion of military aircraft as well as overhauling and repair of these aircraft to make them of commercial value. However, the employment furnished by this conversion process will maintain only a comparatively small number of people in the factories of the design originators. This business will certainly not maintain sufficient numbers of engineers, supervisory and management personnel and workers to assure the survival of the industry, or the continuation of adequate development and research.

**CENTRALIZE
DISPOSAL
POLICIES**

Policies regarding disposal should be determined by one central government disposal agency to be created by legislative action. This would avoid duplication of effort, confusion and possible inter-agency competition. Several agen-

cies and sub-agencies may prove necessary and desirable under this one policy-making central authority, to carry out the mechanical functions involved in the disposition of surplus property.

Such aircraft fall under two categories:

- (a) Combat aircraft which because of military action or the vagaries of use and maintenance by foreign nations are unsuitable for further use and should be scrapped.
- (b) Combat aircraft suitable for further use which can be sold, leased or bartered to friendly foreign nations.

**MILITARY
SECURITY
MUST BE
CONSIDERED**

In the disposal of planes useful only for military purposes, the Air Forces and the State Department should have a veto power over any action deemed adverse to military security. Disposal of this type of plane should be subject to the approval of a board including representatives of the War, Navy and State Departments.

**SUPERVISE
OVERHAUL
BEFORE
DELIVERY**

Overhaul and maintenance prior to delivery should be under direct supervision of a qualified aircraft manufacturer. This is most important in order to insure buyers of the high standard of operation and efficiency of aircraft of American manufacture—and to maintain the outstanding reputation of American airplanes.

**NO PRICE
FAVORS**

No price favors should be shown in the disposal of surplus transport planes. The sale of planes should not be made the instrument of a subsidy. Wherever practicable sales should be made through the manufacturers who originated the design. Overhaul and reconversion should be made only by qualified manufacturers.

**POLICIES
SHOULD FAVOR
NATIONAL
INTEREST**

Disposal practice should be governed by the basic principle that the national interest requires that the United States maintain the strongest possible manufacturing and transport industries. This policy requires the judicious release of surplus aircraft and parts. Great care must be exercised to assure continuance of design, development and market. Manufacturers are clearly dependent on a sound transport industry.

**FOR SALE?
OR
FOR LEASE?**

Although it may not be practical to establish, at this time, and without consideration of many factors, whether disposal should be by sale or lease, care must be taken to assure that control is provided to eliminate the possibility of pressure developing in later years to continue operation of wartime planes. With this consideration, leasing seems to provide the best control in most cases if limited to 2 or 3 years. Consideration should be given to the effect that the planes, leased or sold, will have on the sound progressive development of two vital industries—air transport and manufacturing.

**AVOID
SPECULATIVE
BUYERS**

The industry approves of the disposal of surplus military aircraft which are closely akin to standard civil types. These include the L2, 3, 4, and 5, which are small liaison planes. Care should be taken that there is no wholesale disposal to brokers or speculators who may hold these planes over the market for several years.

**PROBLEMS OF
TRAINING
PLANES**

With reference to the disposal of primary, basic and advanced trainers in civil markets, we urge consideration of these problems:

1. Such aircraft have been built to military specifications for military training purposes.
2. They are designed for military use only and they are not suited for use by civilian purchasers for civilian flight training.

**USE FOR
MILITARY
TRAINING ONLY**

The industry therefore does not agree with the Harvard Business School report that such trainers should be sold at a nominal price. Surplus military aircraft should be given to schools and colleges for military training only. A survey of leading universities and colleges reveals that a great number wish to continue courses in ground school instruction and flight training.

**MUST TRAIN
MEN FOR THE
FUTURE**

We cannot expect to have adequate Air Forces, with trained pilots, navigators, and mechanics, unless we offer opportunity to every able-bodied college student to get such training. The Civilian Pilot Training Program, later the War Training Service, made a remarkable contribution to the Air Forces in the emergency. We strongly recommend the continuation of such a program in colleges and universities. Reasonable federal subsidies will be needed. We must emphasize, however, that such a program should be in the nature of an ROTC program, the course of study and training meeting military requirements. We differentiate in the requirements for this type of training from that of the millions of potential applicants for a personal flying license. Such licensing should not be influenced by the restrictions and high requirements of the suggested ROTC programs.

**GIVE SURPLUS
EQUIPMENT
FOR TRAINING**

To encourage such ROTC programs, as well as training aeronautical engineers, mechanics, and other technicians, surplus military aircraft, aircraft engines, and components, should be given to them.

**DISPOSAL OF
COMPONENTS**

The Harvard Report makes the following statements: "Engines, propellers, and instruments which are not handled carefully are liable to be dangerous on aircraft . . . The larger, more complex, and expensive instruments, such as gyro flux-gate compasses, should be inspected, overhauled, and sold through the original-design manufacturer at prices specified by the Government. The manufacturer is best suited

to insure that proper safety standards are maintained." In making recommendations with respect to surplus combat aircraft located abroad, the following statement is made: "United States combat types which have been subjected to the vagaries of use and maintenance by foreign nations should be unhesitatingly scrapped for their salvage value in components."

**WHEN
SCRAPPING
PLANES ALSO
SCRAP ENGINES**

To maintain the reputation of our aircraft, engines and components, we recommend that when surplus military aircraft located abroad are scrapped, the engines and components should likewise be scrapped. It would be an economic waste to try to salvage most of these complicated aeronautical components by returning them to this country for overhaul.

**DO NOT
DISASSEMBLE
COMPONENTS**

Such components as gyro flux-gate compasses and automatic pilots represent many different units which are installed as systems throughout the plane. To disassemble them after rough military usage they have had under untrained hands in foreign fields, would be no more practicable than returning the completed airplane for overhaul.

**MAKE
U. S.-OWNED
FIELDS
AVAILABLE**

All government-owned air fields not required for military purposes should be made available promptly for commercial or personal flying use at nominal cost to the states, counties or cities, the upkeep and operating costs of which are to be assumed by the state, county or city, with assistance from the Federal government where necessary.

**AIRCRAFT
INDUSTRY
PLANNING
NOW FOR
THE FUTURE**

The aircraft industry, to meet the demands of an air-minded public, should be planning on the type of products which it hopes to manufacture at the end of the war, and should be taking all steps possible for the development, tooling, production and marketing of these products. Experience gained in aerodynamically clean airplanes for commercial use has made and can continue to make great contributions to the design of efficient military aircraft. In order that the nation may

have a strong and virile postwar aircraft industry, the government should *now permit and encourage* companies to use a part of their engineering, tooling, and manufacturing facilities for the development of civilian aircraft. The government should make available to each cost-plus-fixed-fee, as well as fixed-price manufacturer at a nominal cost the design and engineering data, tooling and other facilities developed for his own military aircraft which might be adaptable, at least in part, to his civilian aircraft.

PREPARING FOR POSTWAR JOBS

As long as there is no interference with the war effort, it is undoubtedly to the benefit of the country as a whole to have all opportunities for postwar employment prepared for in advance, so that production and employment may start promptly when the war ends. Domestic and foreign sales markets should then be opened to free, private competition, subject, of course, to national security requirements.

PLAN POLICY FOR TRANSPORT AIRLINES

Other steps which the government should take in the very immediate future are the establishment of policies covering the following items and the informing of the aircraft industry of its policies in regard to transport airlines on the following subjects:

1. Development of a planned and integrated feeder-line system.
2. Every effort should be made to increase the use of airmail as soon as equipment is available and whenever such transportation shall speed delivery.
3. Immediate release of more airplanes to the airlines.
4. Further development of Main Lines—both foreign and domestic.

THE ROLE OF PERSONAL AIRCRAFT IN POSTWAR READJUSTMENT

By Joseph T. Geuting, Jr.

NEW VIEWPOINT NEEDED

If the public is to reap the benefits which personal flying makes possible, a new viewpoint must be taken by the law and the administrative agencies of our government.

PRIVATE FLYING HANDICAPPED IN PAST

In the past, private flying has suffered from the handicap that the purpose for which private flights were made was not important—not by comparison with flights carrying mail, flights for national defense, flights carrying passengers for hire, and flights tending to promote the art of aeronautics. Yet, it may well be that the airplane will fill an important role as a private conveyance of the ordinary citizen, similar in social and economic importance to the automobile, serving to raise the people's standard of living, to make their lives fuller and their pursuit of happiness more effective. The automobile did just that. It created millions of jobs. It made possible thousands of business enterprises which bring wealth and prosperity to communities all over the nation. It drew our people closer together and made all parts of our great country easier of access to every citizen. The personal airplane can do even more than this.

FUTURE MARKET UNKNOWN

While it has been predicted that there will be an immediate market for at least 100,000 personal aircraft, this is a "blue sky" figure, depending on many unknown factors. Should production of 100,000 planes per year be achieved they would represent a total volume of about \$250,000,000 per year, or about one per cent of present aircraft volume.

MORE LANDING FACILITIES NEEDED FOR MASS OUTPUT

It is just and reasonable to expect that the aviation industry will produce the best quality personal airplanes at the most reasonable prices possible. However, it is apparent that at present we cannot hope to achieve volume production, which

should result in reasonably priced products, because there are insufficient facilities from which to take off and land. This problem of establishing a suitable number of landing facilities is one of many which the industry is trying to solve through its own action. It is not asking for any federal funds in support of its personal aircraft program.

**THOUSANDS
OF LANDING
FIELDS REQUIRED**

Statistics reveal that during the several years prior to our entry into the war 80 per cent of all those who purchased airplanes sold them within a year. One of the main reasons for this was the lack of suitable landing places. It is estimated that there are no more than 2,500 landing fields now existing in this country. We need many thousands.

**THREE NEW
TYPES OF
FACILITIES**

At the request of the Personal Aircraft Council of the Aeronautical Chamber of Commerce, the Civil Aeronautics Authority has given semi-official approval to the terms "AIR-PARKS", "FLIGHTSTOPS" and "AIR HARBORS." These are not to be confused with airports costing many hundreds of thousands and even millions of dollars which are used primarily for military and commercial transport today.

**AIRPARKS FOR
COMMUNITY
USE**

An "AIRPARK" may be defined as a community enterprise and a community responsibility to be built specifically as a landing facility for non-scheduled or personal aircraft. It should therefore be built with local funds. It will have runways 2,000 by 300 feet to accommodate those citizens who wish to own and operate their own planes. "AIRPARKS" should be built within the confines of the community, adjacent to the business district. There will be no provision for future expansion as, when one becomes crowded, it is suggested that another be placed in operation.

**FLIGHTSTOPS
FOR THE
COUNTRY**

The "FLIGHTSTOPS" will be runways 1,800 by 300 feet, either built into the prevailing wind or, L-shaped, providing four-way landings. Discussions with state and county plan-

ning groups indicate that they might best be built and maintained by state and county highway departments.

**AIR HARBORS
FOR WATER
LANDINGS**

"AIR HARBORS" should be built wherever there are quiet waters, such as bays, rivers, lakes or sounds, adjacent to a community.

**30 YEARS AGO
ROADS WERE
NEEDED; NOW
LANDING
FIELDS**

The plan to urge the construction of such landing facilities is called to the attention of the committee because of the genuine need for them if aviation is to take its rightful place in personal transportation. Manufacturers cannot hope to find a market for anything they create unless there is a definite use for it. As an example, the automotive industry is cited. The country today is in much the same position, air-wise, as it was from an automotive standpoint in 1913 and 1914, when the automobile was a "new thing". Hundreds of thousands of potential customers held off until the country built good roads.

**NEW ERA
FOR PERSONAL
FLYING**

It is the belief of the aircraft industry that personal flying is entering a new era, as was automobile transportation in 1913-1914—but that unless landing facilities are planned promptly, an important part of the foundation for great aviation advancement will not be ready at the end of the war; and there will be fewer jobs for the thousands who might have been employed in building the facilities, the thousands who might be employed in building personal aircraft, and the thousands who might be employed to service and maintain those aircraft.

**OTHER AIDS
TO PRIVATE
FLYING**

1. Standardization of international airworthiness requirements.
2. Establishment of a policy and program for expanding private flying.

3. Development of a sound policy on navigation aids, in both commercial and civilian flight, and in development of airports.
4. Development of a sound, long-range policy integrated between the Army, Navy and the C.A.B. for the encouragement of research in aircraft, engine, and accessory development.
5. Increase in opportunities for aviation education and flight training.
6. Liberalization of regulation of personal aircraft and pilots.

CHANGE
CIVIL AIR
REGULATIONS

Civil Air Regulations are a deterrent to volume production of personal aircraft. Since 1926, when the Bureau of Air Commerce began functioning, there has been a constant increase in restrictive regulations as to pilot qualifications and the flying and maintenance of aircraft. Many prewar personal pilots laid their discouragement to such restrictions when disposing of their own aircraft or abandoning flying entirely. The industry feels that regulation of personal aircraft and the personal pilot has grown through the years to the point where present regulations impose onerous burdens which hamper the public right to fly and impose additional and unnecessary costs on the flying public.

POTENTIAL
PLANE OWNERS
NOW
DISCOURAGED

With such conditions existing, it is clear that potential aviation students and airplane purchasers are discouraged rather than encouraged, thus narrowing the postwar market and helping to preclude the possibility of volume production, busy factories, and lower costs to the aviation-minded public.

AIR COMMERCE
ACT
SUGGESTED

It is suggested that insofar as the personal aircraft and piloting thereof is concerned, the nature of these operations be considered and an Air Commerce Act be written to cover

them alone. Such an act would (1) make the air spaces available to all persons wishing to travel, (2) place these spaces under federal jurisdiction, (3) place ownership and operation of airplanes on the same basis as that of ownership and operation of automobiles, (4) permit the piloting of aircraft following proof of reasonable skill, and (5) permit flight in a straight line from any point without clearance, flight plan, permission or report except along commercial airways under instrument conditions.

**DRAFT CODE
OF "BEST
PRACTICE"**

A code of "best practice" is suggested in the place of the "should" and "must" type of regulations now in force. Under this code, regulations covering maintenance would be redrafted so that the airplane owners would bear no greater burden than the automobile owner; a pilot would receive a pilot's license with no greater relative difficulty than in securing an automobile driver's license; "learner's permit" would be granted to students without undue formality; no medical or physical qualifications above those of major importance would be required; any individual holding a pilot's license could give instruction providing he does not do it for hire or reward, and a student passing a simple and realistic flight test would be certified.

**SIMPLIFY RULES
OF TRAFFIC**

Traffic rules need simplification, with contact flight rules being relaxed in unregulated air space, control zones being redefined, and regulations generally stiffened for flight in regulated air space, which would include civil airways and control zones.

**RELAX RULES
SANELY AND
SENSIBLY**

Whatever the suggestions, it is obvious that a sane and sensible relaxation of regulations and restrictions must be accomplished if we are to welcome anything which approximates the "air age" as far as personal flying is concerned.

**GIVE BACK THE
RIGHT TO FLY**

The personal flyer has been lost in the shuffle during the past few years, and he must be given the right to fly which,

in many respects, has been taken from him. Only when these regulations are changed will personal flying assume its natural place in transportation.

POSTWAR NATIONAL DEFENSE AND THE AIRCRAFT INDUSTRY

By J. Carlton Ward, Jr.

Answer to Committee Question:

8. *What plans should be made for a postwar national defense program for the aircraft industry?*

A. Through research and development?

B. Through standby capacity?

C. Through other methods?

Technical development is the key to American AIR POWER, present and future. In our national interest, what are the broad facts in this particular, and what should be our country's policy?

**TECHNICAL
DEVELOPMENT
KEY TO
AIR POWER**

History shows us that many great inventions in the past have been developed and perfected by various nations, to the detriment at times of the nation that originally produced the fundamental development or conception. Thus, America produced the first flying airplane in 1903, but in World War I it was compelled to fight in airplanes produced by its allies, and for years the original American invention of the first flying airplane has rested in a British museum.

**INVENTIONS
ARE
INTERNATIONAL**

Similarly, the principles of radar were first announced to the world in the United States as early as 1922 by two Naval scientists in the laboratory at Anacostia, D. C. Yet radar was developed primarily by Sir Watson Watts in Britain and handed back to us after we became her fighting ally and after we had been given time to prepare ourselves for the present struggle with the time purchased by her effort. The Navy, in the spring of 1918, launched a successful flying bomb at Bell-

port, L. I., in cooperation with the Sperry Corporation, carrying one thousand pounds of T.N.T. with a 400 mile range. At the same time, Charles Kettering and his associates began the development of radio controlled flying missiles which they believed could prevent wars. It was left to the Germans, a quarter of a century later, to put it into their concept of total war. Such instances can be multiplied.

**FRENCH
AIR POWER
DECLINED AFTER
WORLD WAR I**

At the expiration of World War I, France emerged as the leading *AIR POWER* in the world, with more airplanes, more facilities and more technicians than could be found in any other country. From that date on she declined steadily, not only in relation to other powers, but also in an absolute degree. From the outside it has appeared that France rested on her laurels. Being a thrifty nation, she seemed to feel that the possession of a quantity of airplanes met the needs of the situation. Subsequently her industry became a political football and attempts were made to nationalize it under a socialist government. And so, as World War II approached, France found herself with politically dominated facilities which she herself, in the throes of war, admitted were inefficient and wasteful. As head of a mission to the French Government in 1940, I was referred to the nationalized Lorraine-Dietrich aircraft engine factory as their worst production headache. Not only was France's production for the most part inefficient, but her designs had not been brought to a top measure of excellence except in a few particular instances.

**LESSONS TO
BE LEARNED
FROM FRANCE**

The lessons to be learned from French experience are clear. They are:

- (1) Possession of the most airplanes at a given moment does not permit the relaxation of continuing development nor the successive production of improved models.

- (2) Private industry, with its competitive aspect, surpasses to a marked degree the performance of government owned facilities.
- (3) Merely to be confronted with a national emergency does not solve the problem and, in the instance of World War II, France was not given time enough to work herself out of her inferior position.

**AIRCRAFT
INDUSTRY IN
GERMANY**

Before turning to America's position, it might be well to examine that of Germany. Germany is popularly regarded as a nation of vast technical resources and possessed of ample skilled labor and engineering talent. Even under Hitler, its factories operated under private management, but with governmental direction as to basic policy and, in many instances, government participation in the ownership. Being a totalitarian state, the basic policies were laid down for the various manufacturers by the government. Germany had started her preparations, in an active sense, in 1933 for World War II. Ample facilities and money had been provided by the government for production and for research and development. While a smaller country than our own, its appropriations for aircraft production were tremendous as compared with ours; under their rearmament program their funds for research and development were many times those available here in our own country.

**THE MISTAKES
THAT GERMANY
MADE**

As a result, there was produced the greatest quantity of then modern aircraft that the world had ever seen when World War II began. However, there were near fatal mistakes made in the German preparations for war in the air, that stemmed from the overall powerful governmental direction. These mistakes were:

**MODELS
WERE
FROZEN**

- (1) Her assumption that airplane models should be frozen in order to produce in quantities, as soon as a satisfactory design had been evolved (this

produced static designs of airplanes modern at the start which, in the early stages of the war, were numerically superior to those of her enemies; but which, as time went on, were inferior technically to the rapidly modified British designs).

PLANES WERE
PRIMARILY FOR
OFFENSE

- (2) Her airplanes were designed essentially for ground cooperation, and were considered by the Germans themselves as primarily offensive weapons; hence, they were weak on the defense against enemy aircraft.

GERMAN AIR
PRODUCTS
INFERIOR

Thus, totalitarian direction produced basic errors in policy which resulted in products which proved inferior in overall competition to the planes made under the relatively free enterprise system between competitive makers in Britain and, later, in America. Superiority is not a static thing—it is a dynamic thing.

REARMAMENT
IN BRITAIN
BEGAN IN 1938

In Britain, active steps toward rearmament in the air began in 1938 and the government laid down a very sound approach to overall British production, with dispersal of manufacturing units and competitive engineering designs. In this atmosphere the now indispensable Mosquito was developed by a private aircraft firm, independent of the direction of the Ministry of Aircraft Production.

BRITISH RADAR
WAS READY

Even more important, when Britain had to meet the threat of German bombing, she was ready with radar locators developed in secret, which permitted the seven hundred British fighters to stave off attacks by as many as twenty-four hundred enemy aircraft *in the air* instead of being wiped out on the ground as had already been the fate of France, Poland and Germany's other enemies. The radar locators, plus the efficient British fighter designs and their superior armament, took such a heavy toll of the Luftwaffe that it became an uneconomical form of war and was abandoned. This hap-

pened in spite of the high prediction Germany had made of subduing England from the air, thus avoiding the risks of a sea-borne invasion for which she had not equipped her Navy. Thus, by having in use at that critical time the fruits of engineering development, Britain saved herself and perhaps the world from Nazi domination.

**YET U. S. A.
WAS ON A
STARVATION
DIET**

And what of America? With all of these lessons before us, we had allowed ourselves to live on a starvation diet, even relative to the appropriations for development of such a second rate power as Italy. At that time we had an undernourished government facility in N.A.C.A., insufficient Army and Navy evaluation laboratories, and a lack of money for industry development contracts.

**GOVERNMENT
POLICIES
UNREALISTIC**

There has been ample testimony before the Congress on the unrealistic procurement policies of the government with respect to aircraft development, extending through the late 1930's. Faced with a certain European war, it still took first French and then, nearly a year later, British money to underwrite sufficient production for American aircraft factories so that the industry was able to accumulate personnel and facilities for the start on its subsequent expansion program.

**5500-PLANE
PROGRAM
CUT TO 375**

On February 20, 1939, General Arnold addressed the National Aviation Forum, stating that the Air Corps' goal was to obtain 5500 planes before July, 1941. In April, 1939, he appeared before Congress to explain his proposed program. The House cut this program for 5500 units to fifty-nine units and the Senate provided funds for 375 planes. It was not until April, 1940, after the fall of Norway, with the world aflame, that funds were made available for this original program formulated a year previously. This program then represented a mere fraction of Germany's air strength.

**U. S. HAD
BECOME A
SECOND-RATE
POWER IN AIR**

The truth of the matter is that America had become a second rate power in the air, except for the unsurpassed job being done by American transports in civil aviation. It was in this condition that we faced the certain world holocaust of war.

MIRACLES HAVE
SINCE BEEN
WROUGHT

There is no need for recounting the industrial and technical miracles that have been wrought with the intelligent cooperation of the armed services, in the ensuing period, which have brought us where we are today. However, the lesson of France should show us clearly that we cannot stay where we now are without a realistic evaluation of the factors that have brought us here and that must be evaluated and made effective if we are to remain a first rate air power.

YEARS ARE
NEEDED TO
DEVELOP A
PLANE

For instance, it is not known generally that the Flying Fortress, one of the world's greatest fighting machines, first began its development in 1934. It required an expenditure of over four million engineering manhours between 1934 and 1942 to bring it to the high state of efficiency as a fighting machine that was necessary to start the unprecedented operation of daylight precision bombing against heavily defended Europe. The Liberator, an equally successful heavy bomber, started in January, 1939, and having available the service experience of the Fortress, became a potent fighting machine shortly thereafter. The medium bombers grew out of an Army sponsored competition about 1938 and were largely developed by French and British purchases before our entry into the war. Even under most ideal conditions, an airplane does not become a good, service-tested machine in under two to three years. As everyone familiar with the war effort knows, airplanes are constantly being modified on the production lines and the P-40, an early type of American World War II fighter, has run through its model series of major modifications clear up to the letter "Q", indicating the necessity for its continued development.

ALL ENGINES
USED NOW
DEVELOPED
BEFORE WAR

There have been no new aviation engines brought out in service in this war that were not started before the European war. For example, the present power plant for the new Super-Fortress and the Navy's great flying boat, the Mars—the

Wright 3350 engine—was begun in 1936 and is only now becoming an accepted, service-tested engine, all at a cost of something more than \$13,000,000. In the liquid cooled aviation engine field, the Allison was started in 1930 and is still undergoing development into higher powers.

**AUTOMATIC
PILOT KNOWN
IN 1913**

In the important field of accessories, the Sperry automatic pilot was first recognized internationally in 1913. From then up to 1932, the development had cost an estimated \$1,000,000. Not until 1932 was the first commercial order for forty-two received by Sperry. In 1935 it was not yet considered of value as a military development. Thus it can be shown that literally all of the American air fighting equipment now in action had its origin in the prewar period. Therefore, it is obvious that a nation cannot have time to arm in the air when confronted with a major international crisis.

**WE MUST
MAINTAIN
TECHNICAL
PROGRESS**

It so happens that Army and Navy appropriations for the most part merge development and production funds. Promptly at the expiration of the active fighting period in this war, there will undoubtedly be brought to bear tremendous political pressure for economy—and it is only right that production requirements will be sharply curtailed. Unless provisions are specifically worked out at this time, whereby development funds will not fall a victim to the sudden postwar demand for economy, they will inevitably suffer the same fate as the funds for wartime production.

**DEVELOPMENT
PROJECTS
MUST NOT
BE HALTED**

A five-year engine or airplane development, cut off after two or three years of developmental work, will probably never bear fruit. For one reason, because the technicians who are the creators of such complex mechanisms will look for more secure positions in the postwar economy. Should there later be an effort to complete the development, it will be found impossible to do so. This will be true even assuming that

there are no new technical developments in the interim to modify the original conception in such a way that it would be better economy to start the development anew. Thus for armament, radar, instruments and all the technical equipment of a modern airplane.

**CONTINUED
DEVELOPMENT
MUST BE
ASSURED**

Unless the principles of *AIR POWER* as outlined here today are accepted and then implemented by a wise policy for continued development, our country cannot be expected to hold its position in world affairs. Commercial designs will, under the American system, be best developed as in the past, by wise regulations of the Civil Aeronautics Authority, wise policies of the Civil Aeronautics Board and the enterprise of the commercial airlines and the private owner demand. This system produced the best airplanes for world commerce and for personal flying in the prewar period and, in a free economy, will continue to do so in the postwar period.

**TASK FOR BOTH
GOVERNMENT
AND INDUSTRY**

Summarily, it should be brought out that there is a legitimate field for government activity and for private industry in which each is by nature best adapted for its task.

- (1) Thus, fundamental research not applicable to specific projects can best be fostered and accomplished in government laboratories such as those at the N.A.C.A.
- (2) The special application of research to particular designs or projects is the legitimate function of private industry with all of its competitive stimulus. This will avoid the mistake made by Germany, by providing a diversification of solutions not readily possible under a totalitarian or government dominated system.
- (3) The evaluation of the result of private industry developments can best be accomplished impartially by the Army and the Navy in their respec-

tive facilities, such as Wright Field, Eglin Field, the Naval Aircraft Factory and the Navy evaluation centers.

**VITAL
FUNCTIONS
NEED NEVER
CONFLICT**

These three vital functions in overall development should never be in conflict, one with the other, if wisely molded into the overall policy. This will provide America's answer to the competition of other great powers, if it includes the necessary procurement of service-tested quantities of the new models, developed in sufficient quantity for production and tactical use.

**PLANNING FOR
POSTWAR**

Here are the answers to the Committee's questions with respect to planning for a postwar national defense program for the aircraft industry:

- (1) Present development contracts should not be terminated.
- (2) Military research, design and development should be continued on a constructive basis through competitive private industry.
- (3) A production program for the aircraft industry should be maintained to retain its ability to establish production processes and to permit the air forces to become familiar with the handling of such planes. Based on an obsolescence factor of five years for the life of a first-class fighting airplane, we assume that 20 per cent of the number of airplanes in the postwar air forces will be replaced annually.
- (4) New and advanced models of all types of military aircraft required for a balanced air force should be designed and developed. Quality of the product should be the primary factor in placing orders.

**NATIONAL
AIR POWER
POLICY NEEDED**

The United States would have been a third-rate *AIR POWER* if the present war had been deferred a few years. Totalitarian governments subsidized their aircraft industries heavily. The aircraft manufacturers want no such subsidy, but do suggest a *National AIR POWER Policy* which will allow the aircraft industry to maintain leadership in design and preparedness to resume large-scale military production at any time if it should be necessary. In addition, such a policy contemplates an air force maintained at such a level as to assure the nation of adequate air defense. The above suggestions outline a program for minimum preparedness compatible with full security and one which would permit rapid expansion in time of emergency.

**A STRONG
INDUSTRY
MUST BE
MAINTAINED**

AIR POWER presupposes several elements, among them airplanes, trained personnel, technical staffs, management and productive capacity. All of these are essential. A strong industry must be maintained with operating productive capacity at least equal to the postwar needs of the armed services. Additional capacity, preferably through standby plants, should be available and ready as the necessity arises. It is suggested, therefore, that some proportion of existing aircraft plants which are not needed for aircraft or other production be kept available for war production in the event of national emergency. This standby capacity could be administered by the aircraft manufacturers on a contract basis. The possibility of using this standby capacity for temporary storage of surplus should be investigated.

**YOUTH SHOULD
BE TRAINED**

All possible methods should be used to train the youth of the country in aircraft and in technical matters. The technical and mechanical skill of the nation is one of its greatest assets, and this should be maintained at any cost.

**INDUSTRY
SHOULD BE
STRENGTHENED**

All design and engineering data, tooling and production facilities developed as a result of government orders should be made available to manufacturers for civilian production.

The established aircraft manufacturers should be utilized by the armed forces in handling the modification and repair of military aircraft in various locations throughout the world.

SUMMARY

By J. Carlton Ward, Jr.

HOW TO HAVE AIR POWER

In order to keep the peace after winning the war and to promote the general welfare, the United States must have *AIR POWER*. This can be accomplished by:

1. Having an adequate, ready air force composed of superior aircraft and competent personnel.
2. Training our youth to fly and service airplanes.
3. Maintaining air bases essential to security and commerce.
4. Expanding our domestic and foreign air transportation, and personal flying.
5. Maintaining a strong aircraft manufacturing industry, with continuing world leadership in research and development.

INDUSTRY'S POSITION ON DEMOBILIZING WORKERS

With respect to the workers involved in the demobilization of the aircraft industry when victory is won, the industry

1. Agrees with the principle of adequate unemployment insurance, as an essential to orderly manpower demobilization and reemployment.
2. Believes that the new employer or educational organizations should re-train workers, thereby avoiding re-training for non-existent jobs.

3. Agrees that transportation of workers to bona fide residences or to new jobs at government expense is desirable.

**FINANCIAL
RESPONSIBILITIES
HEAVY**

The rate of net profits on sales volume in aircraft is the lowest of any industry engaged in war production, amounting to but 1.8 per cent in 1943. The entire working capital of the aircraft industry would not equal one month's operating costs at present production rates. It, therefore, is obvious that the industry, while eager to do its full share during the conversion period, can be of very little help in assuming financial responsibilities of the manpower demobilization and reemployment process.

**POLICY ON
CONTRACT
TERMINATION**

Sudden changes in war requirements are necessitating termination of some war contracts. The industry believes that when such occasions arise contracts should be terminated promptly. There must be full coordination between Army and Navy cutback programs and between government agencies and aircraft manufacturers. Thus capacity released by one agency could be used by another and labor resources conserved.

**FACTORS TO
BE CONSIDERED
IN MAKING
CUTBACKS**

Many factors must be considered in making cutbacks.

- a. First cutbacks should be in industries producing aircraft only during the war emergency.
- b. Problems of the creator of the original design should have first consideration when cutbacks are contemplated.
- c. Other factors which should be weighed are present production status of manufacturers concerned; local manpower situation; overall costs of the products; manpower utilization; meeting of production schedules; contributions to aviation progress; needs of the aircraft industry to pre-

pare for postwar development and production; obsolete aircraft should be cut back sooner than those of more advanced design.

Notice of cutbacks should be given to manufacturers sufficiently in advance to permit them to complete the production flow from raw material to finished work (60 to 120 days).

Subcontractors and vendors should be notified promptly by the prime contractor.

Employees must be notified as soon as revised personnel requirements can be computed.

Cutbacks in the aircraft manufacturing industry should be synchronized with increases in other war production and with the re-expansion of other civilian industries whenever possible.

DISPOSAL OF SURPLUS AIR EQUIPMENT

When the war ends there will be surpluses of aircraft plants, military aircraft and military air fields. Surplus aircraft factories should, if possible, be sold or leased to the present users. If not feasible, the government should dispose of them to others. If not needed for aircraft or other production, these factories should be kept, under private management, as stand-by plants.

Disposal of surplus aircraft should be controlled by one central government agency.

Combat aircraft rendered unsuitable for further use should be scrapped.

Combat aircraft suitable for further use can be sold, leased or bartered to friendly foreign nations under the control of proper government agencies.

Overhaul and maintenance of such aircraft should be under the direct supervision of a competent aircraft manufacturer. Planes useful for scheduled transport operations should be disposed of through limited leases or sale without price discrimination. This must be done judiciously to eliminate the possibility of pressure developing in later years to continue operation of wartime planes.

Small planes with possible non-military uses are divided into two groups. The small observation and liaison planes can be released to any market. Civilian sale of military training planes must be considered in the light of performance characteristics of these aircraft. Such equipment can be released on a wide scale for military training in schools and colleges.

Major components—engines, propellers and instruments—should be scrapped when surplus military aircraft located abroad are scrapped.

Government-owned airfields not required for military purposes should be made available promptly for commercial and personal flying.

**PERMIT
PLANNING
NOW FOR
POSTWAR**

To further the development of civilian aircraft production, the aviation industry should now be allowed to plan types of postwar products and use part of their facilities for this purpose if military needs are met.

Transport airlines should be aided in the development of main and feeder lines, through the release of airplanes and increased use of air mail.

Personal aircraft manufacture needs more landing facilities and liberalization of Civil Air Regulations to achieve volume production.

With respect to planning for a postwar national defense program for the aircraft industry, the industry believes:

PLAN FOR
NATIONAL
DEFENSE
PROGRAM

1. Present development contracts should not be terminated.
2. Military research, design and development should be continued on a constructive basis through competitive private industry.
3. A production program for the aircraft industry should be maintained to retain its ability to establish production processes and to permit the air forces to become familiar with the handling of such planes. Based on obsolescence, we assume that 20 per cent of the number of airplanes in the postwar air forces will be replaced annually.
4. New and advanced models of all types of military aircraft required for a balanced air force should be designed and developed. Quality of the product should be the prime factor in placing orders.

NATIONAL
AIR POLICY
URGED TO
MAINTAIN
LEADERSHIP

The aircraft manufacturers want no subsidy, but do suggest a National Air Policy which will allow the industry to maintain leadership and design and preparedness to resume large scale military production at any time if it should be necessary.

It is suggested, that some proportion of existing aircraft plants which are not needed for aircraft or other production be kept available for war production in the event of national emergency.

All possible methods should be used to train the youth of the country in aircraft and in technical matters.

The established aircraft manufacturers should be utilized by the armed forces in handling the modification and repair of military aircraft in various locations throughout the world.

