these people to at least an eighth grade level.

All this is fine, but we must keep it in its correct perspective. The Army's concern should be on becoming more military. It must become more intensely disciplined and more tightly organized. A high standard of discipline is essential to combat effectiveness. On today's atomic battlefield, where dispersion is the key to survival, leadership is required at the lowest echelon more than ever. Battle leadership can exist only where discipline results in immediate, unquestioning, automatic reaction to command and authority. Training must be tougher with more realism. Realistic training may cause more injuries in training, but as a result there will be far fewer casualties in combat. A leader at any level who fails to grasp the importance of absolute enforcement of all orders, directives, and instructions at all times, is doing his men the greatest disservice possible. He is laying the seeds for uncontrolled hysterical reaction in the first day of battle. Discipline cannot, like charm, be turned on or off to suit the occasion. It is evident that the time the Army can and should devote to further moral and spiritual development of its young soldiers must be consistent with its primary mission of turning out trained, battle-winning teams. Any time spent beyond that limit seriously impairs the accomplishment of that mission.

Properly, the Army should supplement—and then in a very minor way only—the instruction given by home, church, and school; but as long as this instruction is inadequate, the Army must do far more than supplement. This is an unwarranted burden. It is a task which cannot be accomplished in the short time available. Real moral and spiritual strength of the toughness we need to win over the Communists cannot be developed overnight; it has to be developed over the years and must commence at the very outset of a man's life.

Success or failure in turning out trained soldiers thus depends to a great extent on what you have done with our youth. The things that have happened in his own home, his school, and his church will determine whether or not he is amenable to discipline, receptive to instruction, and aware of his duty to serve his country.

You must develop in every youth, from childhood on, the feeling that the security, the well-being, and the happiness of his family and community are his responsibility. To achieve this, the family must once again really be the center of our society; and all our social institutions—schools, churches, civic organizations, welfare groups—must

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AMERICA'S MOST CRITICAL DEFENSE FRONTIER

By COL. MORGAN GOODHART

It has been estimated that fewer than twenty well-placed thermonuclear bombs could paralyze, and perhaps decimate, much of the heavily populated northeastern United States. Such destruction would cause irreparable damage to the entire country. The key problem of United States security is to prevent such damage to the structure of the nation while maintaining unimpaired our ability to retaliate should such an attack occur.

I believe we all recognize that the United States, by virtue of its position and activity as leader of the Free World, remains the principal target for Communist attack. The basis of our own national security, as well as that of the rest of the Free World, necessarily rests, therefore, upon American power. To the extent that the United States can adequately provide for its own air defense against nuclear and thermonuclear attack, to that extent, the United States adds to the security of the Free World as a whole; and likewise adds to the deterrent against Soviet aggression afforded by the American capability to make atomic retaliatory attacks.

Significant was the view expressed early in the postwar era by General Henry H. Arnold, Commanding General of the Army Air Forces in World War II, when he said, "If there is a third world war, the strategic center of it will be the North Pole." The basis for this view is the fact that the Arctic lies athwart the shortest flying distances, the great circle routes, between the two Super Powers. In fact, a glance at the polar map shows that the Arctic lies near the center of the great industrial and population centers of the world, all of them located in the Northern Hemisphere.

That the Soviet Union is likewise cognizant of the strategic and military importance of the Arctic in a future war, is borne out by numerous indications of Soviet military and economic activity in the Arctic region.

I believe that a critical examination of the position of the Soviet Union and the United States and Canada in the Arctic will show that the Arctic is indeed America's most critical defense frontier. Such an examination should reveal the extent to which these powers have responded to the challenge and to the opportunities afforded by the Arctic in the Air Age World. From such an analysis we may reasonably hope to draw some pertinent conclusions relevant to the air defense of the United States.
show that comparatively little has been done in the North American Arctic to develop its resources and transportation facilities.

However, in an effort to meet and resolve new problems of United States-Canadian defense in the air-atomic age, a joint United States-Canadian expedition in 1954 proved the feasibility of using a new trans-Arctic sea route via McClure Strait during part of the year at least. We may note, in passing, that the Soviet Union's northern sea route, which is open for about two and a half months a year, has been extremely instrumental in the development of the Soviet Arctic, and now plays a vital role in providing logistical support for Soviet Arctic military establishments. The Soviet position in the Arctic is further strengthened by the co-ordination of north-south traffic along the great Siberian rivers which connect the Trans-Siberian Railroad with the Arctic shipping route. Of course, air transportation is being used increasingly in the Arctic regions on both sides of the Pole for the movement of passengers and even bulky goods. Trans-Arctic commercial air service will also increase—the first regular schedule was that initiated by Scandinavian Airlines last fall, between the United States West Coast and northwestern Europe.

As a result of greater experience in Arctic development, the Soviets—as might be expected—are far in advance of Canada and the United States in building on permanently frozen ground, laying railways, and prospecting for oil.

Let us proceed to examine the political and military challenge which the Soviets have given through their intensive preparations of an offensive nature in the Arctic. We shall discuss the political aspects first, inasmuch as the U.S.S.R.'s "ice water imperialism" provides the "legal" basis for much of its military activity in the Arctic Ocean area.

In view of the Soviet development of her Arctic land area, it should occasion little surprise that the Soviets early extended their activity to the Arctic Ocean itself. The following quotation, from Interavia, XI (1955), may be regarded as typical of Soviet thought:

Historical, political and legal facts give us a claim to full sovereignty over these Arctic seas. We conquered them; we are vitally interested in them. In these latitudes shipping has a special character due to the ice; the international rules governing the open seas cannot be applied to the Arctic... For all these reasons the Arctic seas are our national waters, whose legal status must rest on the unconditional recognition of the U.S.S.R.'s sovereignty.

This view, stated by the Russian lawyer, S. A. Vishnepolski, in 1952, has also been voiced by the Legal Institute of the Moscow Academy of Science and by the Soviet Arctic Institute, founded in 1920 by Lenin.

If the claim applies only to the Soviet sector of the Arctic Ocean up to the North Pole, the Russians can assert with truth that they did not invent the sector theory, but took it over ready-made from Canada where a French-Canadian Senator (Pascal Poirier), introduced it in the Canadian Parliament as long ago as 1907. In 1926 the U.S.S.R. declared all the waters and land areas in its sector of the Arctic Ocean as Soviet territory; and from 1936 onwards, all air, sea, and land areas in this sector were placed under the authority of the Administration of the Northern Maritime Route.

SOVIET AVIATION & SCIENTIFIC DEVELOPMENT IN THE ARCTIC

Systematic study and exploration of the Russian Arctic did not begin until 1920. From 1923 to 1938 some 70 permanent Polar stations were established throughout the Soviet Arctic. Since 1938 their number is estimated to have grown to more than 500. Ports were built and an Arctic air network developed. Some 150 airfields have been constructed and Russian Dakotas of the C-47 type now distribute freight to all the new towns.

As long ago as 1937, world distance records were established by Russian pilots flying single-engined aircraft across the Arctic from Moscow to the United States West Coast. Additional Arctic flying experience was gained during World War II when many hundreds of aircraft were flown from the United States to Alaska where they were taken over by Soviet pilots and ferried to Siberia.

By 1945, Soviet Arctic flying capabilities were such that we find Admiral Papanin, hero of the 1937 Soviet Polar Expedition, boastfully writing in Pravda the following illuminating passage: "Our air routes cross the Arctic in all directions. And when our airmen venture far out over the ice in powerful aircraft, covering 2,000 to 2,500 miles in a single flight of 12 to 15 hours, this is no longer considered to be anything extraordinary or heroic. Our Arctic has expanded..."

Since then Soviet interest and activity in the Arctic have been intensified. Perhaps the most striking manifestation of this activity has been the occupation of floating ice islands south of the Pole on the American side of the earth's axis. Thus far, such islands known to be Soviet-occupied are Polar North-3 and Polar North-4. (A similar ice island, T-3, Target-3, was occupied by the United States Air Force in 1952 but abandoned in 1954 because it had drifted to within a short distance of "Alert," a United States meteorological station on the extreme northern coast of Greenland, thus losing its chief value as a weather station. T-3 was buzzed by Soviet aircraft last May.)

Polar North-3 and Polar North-4 as well as T-3, are floating islands of solid glacier-type ice drifting in the pack ice of the Arctic Ocean near the Pole. Of the two Soviet ice islands, Polar North-3 is the more important. At present it is actually on the North American side of the Pole, not too far from Greenland. Polar North-4, is opposite Alaska. Though the Soviets insist that the objective of their scientists and technical personnel stationed on these ice islands is purely scientific, their protestations must be evaluated in the context of their other activities in the Arctic, notably those indicating intensive military and air preparations of an offensive nature.

Almost the whole Soviet long range bomber force is based on airfields located along the Arctic and North Pacific coasts and on Arctic off-shore islands. Their major

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About the Author

In preparing this paper, which was presented as a University Lecture, Colonel Goodhart points out that he drew freely from the writings of the best qualified and most competent authorities on the Arctic; and he wishes to acknowledge the help he received from members of the Air Force staff at the University of Oklahoma, in particular from Captain Raymond R. Fliegel. Colonel Goodhart graduated from the University of Georgia in 1933 and received a master's degree in 1936. The University of Vienna conferred on him the Ph.D. in 1951. Since 1952 he has been Professor of Air Science and Commanding Officer of the AFROTC at the University.
forward bases are located along the northern coast of the U.S.S.R., extending from the Kola Peninsula in extreme northwestern Russia, to the Chukotsk Peninsula in extreme northeastern U.S.S.R. In addition, the most advanced bases are established on the principal Soviet off-shore islands, among the more important of which are Franz Josef Land and the New Siberian Islands. Reputable and generally reliable sources of aviation news report that the network of Russian airbases along the Arctic and the Northern Pacific coasts consists of 150 to 200 air force, guided missile, and supply bases, and communication and radar centers. Hangars, administration buildings, and fuel and ammunition dumps of the Arctic bases are underground. This is also the general practice throughout the U.S.S.R.

The chief reliance of the Soviet Long Range Air Force is still believed to be the Tu-4, a B-29-type aircraft. (Tu stands for Tupolev, the name of a leading Soviet aircraft designer.) Substantial numbers of these aircraft are available, possibly well in excess of 1,000. The Tu-4's, operating from advance Soviet bases in the Arctic, are capable of bombing on one-way missions, any point in the United States except Florida. Besides the Tu-4, the Russians have for some time had a turbo-prop bomber, the Tu-200, comparable to our intercontinental B-36; the Tu-200 is presumed to carry at least 5,000 miles.

In addition, the Soviets revealed at the annual May Day fly-by last year, that they now have Type 37 bombers comparable to our best heavy long range bomber, the B-52 Stratofortress. Last May the Soviet Union also displayed for the first time, nine new jet-powered medium bombers comparable to our B-47. They are commonly designated Type 39. Sixty of them flew over Moscow in perfect formation last June.

That these long-range Soviet airplanes have been probing our northern defenses for some time is abundantly clear. Two years ago, in a special report on United States air defense, prepared by William A. Ulman for Collier's (October 16, 1953), the following illuminating passage occurs: "Almost every day, at least one unidentified airplane violates our northern continental borders. They come in at all times and places, and some have even penetrated deep into North Central Canada."

**LAND FORCES: TYPE AND DISPOSITION**

According to Aviation Age (September, 1954), "the Soviet armed services, too, have a special arctic branch, the Special Units for Arctic Operations (MIPED). This, unusually enough, is under the direct command of the Soviet general staff."

Intelligence Digest reports for 1953 and 1955 indicate that major parts of the Soviet ground and paratroop forces have been shifted to the Far North and Far East. "... Soviet Arctic paratroops are reported to be very well equipped and can be provided, by air transport, with motor vehicles specially designed for use in the Arctic."

Let us then summarize the significance of Soviet Arctic development and military capabilities:

1. Geographically, the Soviet Union is incomparably more vulnerable to attack from the Pole than is Arctic North America. Major cities and other industrial population centers lie in relatively close proximity to the Polar area. Thus they can be reached much more easily from the Pole than can the chief centers of United States and Canadian industry.

2. From the standpoint of strategic air operations directed against major industrial areas, this is a great geographical advantage for us and a correspondingly great disadvantage for the Soviet Union.

3. Therefore, if air and military operations from Polar areas are to play a significant role in any future war, the initial advantage at least would appear to lie with the U.S.S.R. In such an attack the Soviets would also be able to capitalize on the element of surprise, as much as the U.S.S.R., not the United States, would have to initiate hostilities. One of the first objectives of such a possible attack would probably be the elimination of North American bases of operations. Unofficial but apparently reliable information indicates that virtually all Soviet long range air units are now deployed in the Arctic and Polar areas, that major parts of Soviet ground forces have been shifted to the north and Far East, and that the Soviets have generally intensified preparations for Arctic warfare. This information, if true, would indicate the adoption by the Soviet Union of a Trans-Polar strategy which is apparently designed to counter and offset America's Trans-Oceanic strategy aimed at the containment of Communist expansion.

4. In this connection, it may be significant to note that the increasing Communist pressure in the Far East possibly represents an effort to divert United States strength to that area at a time when increased attention to the air defense of North America is required.

**THE NORTH AMERICAN RESPONSE TO THE SOVIET CHALLENGE IN THE ARCTIC**

Let us now examine how and to what extent we have responded to the challenge posed by the development of the Soviet Union's Trans-Polar striking capability, for this is the heart of the matter—the effective air defense of North America, in conjunction with the maintenance of our deterrent retaliatory capability against possible Soviet aggression. In general, it would appear that for too long our very remoteness from the Arctic, together with our accustomed manner of viewing it, has tended to thwart the adoption of a positive and aggressive attitude toward the Arctic by both military and civilian planners.

Nevertheless, something is being done to strengthen our northern defenses, although it is apparently inadequate to insure an effective air defense for the United States and Canada now or even in the near future.

In 1951, for instance, the United States and Danish governments reinforced the agreements of 1941 for the defense of Greenland. This has been followed by the establishment of numerous weather stations, the construction of Thule—at a cost of nearly $500 million—and of B-1 and Sundre Stromfjord (BM-8), the provision of two all-weather fighter wings, and the construction of radar stations. These form a southeastern counterpart to the defense preparations in Alaska.

At the same time, Alaska itself, has now become an advanced bastion of defense. As recently as October 16, of last year, the United States Army activated the 71st Infantry Division at Anchorage. An air division mounts guard from our Ladd and Elmendorf Air Force Bases. The gap of the Canadian North still remains to be filled. Here, there is neither radar nor airfield for a distance of more than 1,200 miles. A fifty-year plan has been projected by the Canadian Government to develop and defend this sector. Under a Canadian-American agreement, an advanced radar chain is to be built approximately along the 70th parallel, from Alaska to Greenland. This distant early warning line, we are told, will take years to construct and its cost will be fabulous. Before it can be completed, the difficult problems of power supply, protection against cold and wind, and of living under Arctic conditions must be solved. Behind these advanced radar stations the Mid-Canada Line...
extends roughly along the 55th parallel. It is partly in operation but the warning it supplies will be too short. Still farther south, a third line of stations, the Pinetree Chain, is nearing completion. It will keep watch on the United States-Canadian border. Finally, inside the United States, local radar stations cover critical targets.

Thus four electronic barriers will be erected between the Pole and the sources of American power and life. The most northerly will be some 1,850 miles from Chicago and will give warning of three or four hours. It will be, however, many years before this system can be mounted in its entirety.

**PROBLEMS & RECOMMENDATIONS**

During the period of United States monopoly of atomic weapons, the problems of our security were satisfactorily resolved to a large degree by the maintenance of our Strategic Air Command's atomic capability and the development of United States-sponsored systems of regional security, such as the Rio Pact, the Australia-New Zealand-United States Pact, NATO, and a number of others.

When, however, the Soviet Union built up a substantial stockpile of atomic weapons, refusing meanwhile to permit effective operation of proposed atomic armament controls, the situation changed radically. According to no less an authority than Mr. Thomas K. Finletter, who was appointed Chairman of the President's Air Policy Commission in 1947, and who later served as Secretary of the Air Force, the U.S.S.R. will by 1956 be in a position possibly decisive blow. This means that in the event of hostilities the United States must be able to seek out and destroy enemy airbases and installations.

Another problem is that of vulnerability. For example, we recently established bases on the coast of the Arctic Ocean, would possess unparalled destructive capability, and would be relatively invulnerable to countermeasures, since it could fade away into the trackless expanses of ice and water easier than an Arab in the Sahara. Here, if anywhere, military competition will be a game of wits in which flexibility and versatility will win over brute force."

Colonel Fletcher continues, "There are no technical obstacles formidable enough to prevent the development of such a tactical capability. Admittedly it would take time. Modified landing gear must be designed, auxiliary equipment developed, aircraft modified for Arctic use, organization and training accomplished, tactical doctrine formulated and tested, geophysical factors studied. ... To the defeats who insist that it could not be done, we can now give a powerful answer: the general feasibility has already been demonstrated. ... Units of the Alaskan Air Command and Air Rescue Service have shown that with proper direction such operations are practical and safe. What was done with obsolete aircraft and equipment can be enormously improved upon if we apply our modern technology to the task. ...

"Fundamental to the growth of air power in the Arctic is the development of high-performance transport capable of landing on unprepared snow and ice surfaces. This capability would free us from our established bases and open the door to exploitation of several million square miles of presently inaccessible territory. Ice runways suitable for wheelgear aircraft could be prepared on short notice almost anywhere in the Arctic and use of snow, ice, and water as engineering materials would take on new significance. With these means of experimenting, Army, Navy, and Air Force strategists could then evaluate new concepts for the employment of military force in the Arctic ...."

Let us now attempt to formulate some conclusions based on the evidence already presented. First, the problem of United States security is obviously manifold. Among the missions with which the military forces are charged, that of the air defense of North America has assumed increasing significance.

Development of the Soviet trans-Polar capability, especially in the light of its mounting stockpiles of nuclear and thermonuclear weapons and augmented forces of long-range aircraft, makes the Arctic America's most critical defense frontier. The intensive Soviet exploitation of the Arctic provides its forces with a great initial advantage, especially for an unprovoked, surprise attack. The present United States air defense system is inadequate and must be greatly improved. There will, how-

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we speak of a community of love, of giving and acceptance, wherein each person freely renders responsible service and receives deserved benefits.

A word about goals or ideals: we live by them. Put this way, it becomes a bit silly to speak of them as "impractical," as we sometimes do. If we live by them, they are surely practical. Of course, our ideals differ, especially with respect to loftiness; some shoot for bigger stakes, so to speak. Some live in larger worlds than others; thus their ideals are more comprehensive. Some have more mature imaginations than others; and their ideals are more sublime—for some the heavens declare the "glory of God," for others the heavens are at best the source of sunshine and rain, and, where the imagination is quite limited, the heavens may rarely be seen. Some live in the bright light of a great faith and envisage the "kingdom of God"; others live in the dimmer light of a more circumscribed faith, and vision is shortened. Yet, probably none is quite without goals: they serve as frames of reference, prompting, prodding, giving direction to present activity, making it possible to "Remould life nearer to the Heart's Desire."

And here we speak of the Goal as a community of persons. Why the capital-letter "goal"? To suggest that man's highest vision is always transcendent, always beyond, the unrealized ideal pointing onward, the inexhaustible cause of advance. But it is also within, realized thus far in human experience, as in close friendship or between man and wife; elsewise we would have no vision. And see how the circle completes (perfects) itself: our knowledge gives the hint; imagination or insight takes us beyond to grasp the Goal; the Goal serves as directive for further knowledge, larger experience.

A closing note: In giving himself to the Goal man gains greater power to act, and opens the way to "endless advance." So far as we can judge, man gains strength-power to act—from goals envisioned; and this activity may go on indefinitely long. Is this common experience in the loving devotion of husband and wife in planning the ideal home, in the commitment of the scholar to his work in his search for truth, and so on? Is this "religious voice" at its finest, everlasting life in unreserved devotion to God and neighbor?

The Roots of Communism . . .

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labor organizations in undeveloped areas. If the leaders and members of labor organizations cannot receive guidance and assistance from the United States in practical democratic techniques, if they are ignored by us or just simply hated, they will turn for help to the ever-eager radicals and Communist agitators. The "instruction sheets" to our "gift parcels" and technological marvels should be filled out with suggestions of ways and means for a peaceful integration of workers, merchants, peasants, and landowners into a sound national economy. The workers and peasants in Central America need social reforms badly and most of all they need "bread and land." We can help them. If we do not, they will fall prey to the Soviets. The Soviet remedy calls for violence and destruction and will ultimately bring along the loss of freedom and the enslavement of the mind. Our approach, therefore, should be a peaceful and constructive one. We should offer techniques and ideas to the labor organizations and a working program for democracy rather than arms for small military cliques.

I am convinced that we can go after the Communist workers in the labor organizations in Central America with an unemotional, but aggressive and constructive program, to show that the laborers and peasants "can have their bread, their land, and maintain their freedom, too." Without nourishment the roots of Communism will soon shrivel and die.

The 1954 Election . . .

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Carthay debacle. And there is no doubt that he can get the nomination again if he will take it. The Democrats will presumably nominate Mr. Stevenson. But how could he hope to win, even though he richly deserves the office? He could only conduct a "me-too" type of campaign or throw overboard the Democratic program which has been painfully hammered out since 1932. The Brackin Lees, the Malones, and those reflecting the Chicago Tribune mentality may find the 1956 fare extremely palatable, but they could hardly be expected to join the Stevenson dinner party. They are tied to Mr. Eisenhower with strands of steel. All of their talk of a third-party, composed of the intelligent Republicans and the intelligent Southern Democrats—and there are no others—appears only as a feeble effort to pull the President a bit toward the right. If they are serious, they need no more adding machines than they already have in their counting houses to tally the intelligent vote, for the American electorate will not forego the opportunity of choosing again between two of the most popular candidates who ever battled one another in our presidential sweepstakes.

From the present vantage point, I would think that the Democrats should hope, and pray, that the President would make a serious mistake within the next fifteen months or that the national economy would suffer a noticeable decline. Under such circumstances, if war did not come, they might win in 1956. Could we be about to witness the emergence of an entirely new phenomenon in our national politics—the election of a Republican President and Democratic majorities in both houses of Congress?

America's Defense Frontier . . .

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ever, never be 100 per cent air defense possible.

Especially acute is the present security posture of the United States in the Arctic, both with reference to offensive and defensive operations, which would be launched in event of Soviet attack.

However, improvement of United States Arctic air capabilities along the lines recommended by Colonel Fletcher should do much to rectify this situation and enhance our ability, in the event of war, to seek out enemy air forces and their supporting installations. Much of it may have to be done by tactical fighter-bombers rather than long-range strategic aircraft. A tremendous geographical advantage will lie with such tactical forces, owing to the relative proximity of many military as well as economic and political targets to the Polar regions. The extent to which this advantage could be exploited will be dependent upon the rapidity and effectiveness with which such forces are developed, trained, and equipped for Arctic-type operations. In this connection, the most pressing military-technical problems are the development of Arctic-adapted aircraft and means of supplying them with fuel and lubricants.

Improvement of our Arctic offensive capabilities will serve to make the oft-repeated threat of our devastating retaliatory attack more real, and thereby serve as a more effective deterrent to Soviet aggression. Improvement in Arctic operational capabilities will also vastly increase the effectiveness of Air Defense over the North American Continent. Considering our relative weakness in the Arctic at present, there is a pressing need to become Arctic-minded, especially among both military and scientotechnological people.

In view of the critical nature of the present situation, with the danger of substantial and sizeable Soviet nuclear and thermonuclear attacks in the near future a real