

Overview: Project 2020

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The aim of Air Command's Project 2020 was to assess the implications of major international and national trends that might influence the composition and structure of Canadian Aerospace Forces in the period 2020 and beyond. It was not the intention to advocate change, merely report the future trends of change as determined from extensive research of material available today. Although change may be perceived as threatening, documenting trends of change may provide opportunities to pro-actively influence the evolution of change.

The Project 2020 Report describes a class of national and international problems not previously experienced by conventional political entities. Western industrialized nations have traditionally exercised forms of economic, political and military power that were not designed to contend with the rate or the magnitude of behavioural change that seems to be occurring as the world transitions from the industrial age to the information age. And adopts Global positions while at the same time attempting to protect National and Regional interests.

Demographics/Human Resources

1. Historically, long-term population forecasts have been variable due to difficulty in predicting accurate fertility rates. Modern demographers compensate for this shortcoming by producing a number of projections, normally a low, medium and high set of figures, and they do not attempt to identify a best assumption. By averaging the population forecasts from several sources, there are conclusions that can be discussed without becoming engrossed in the specific numbers involved. There is one context in which population forecasts can be used with relative certainty, that is as warnings of social change.
2. There is consensus that the world's population will continue to grow for the foreseeable future and that regardless of changes to the fertility rate, the most significant factor in increasing the population is the extension to life expectancy of virtually all age groups. There is also consensus that the greatest percentage of increase in population will be in the developing regions and the lowest growth rates will be in the industrially developed regions of the world. Without a lengthy debate on the methodology or accuracy of specific numbers, we should certainly be concerned with the numerous problems that could arise in countries where higher growth rates may be manifest in internal economic and political friction and perhaps in tensions between countries and their neighbours. Urbanization, international immigration, rivals in ideology, in culture, in economic development or in military power have often instigated conflict that spreads well beyond the region or countries of origin.

Resources

3. The paradox of supply of mineral resources, water and agricultural resources, is that there is probably an eventual global insufficiency of both for a society of continuous

- growth, (or an "industrial age" society) but there may well be a surplus of both mineral and agricultural produce for a conserver society. Changes in the proportional economics or production costs may make some resource rich industrialized nations the antiquated mine and mill operator, with manufacturing and processing increasingly taking place elsewhere offshore. New technologies may change extraction and production techniques, but at the cost of many human functions and processes in resource industries. So long as labour is a mere component of capital, earth products will tend to flow by pipe, rail and ship to overseas concentrations of "cheap" capital. Governments' regulatory overview, or mineral and agricultural stocktaking functions, may well increase, but the backfire of measures of protectionism and product cartel activities will be significant.
4. Current consumption rates and predicted global population trends indicate that increases in world food production have levelled off and are starting to decrease. Water could become the oil of the future in some parts of the world with an increase in regional instability. Current market beliefs indicate that an increased demand will result in an increased supply; however, realistic resource limitations, lack of arable land, and climatic changes may make this relationship impossible. Environmental issues, increased prices (monetarily and environmentally), and improved global awareness will force a steady increase in global Research and Development of alternative energy sources. Technological advances could help overcome some of the water and food production problems that will be stressed by population growth.
 5. The second part of this Resource paper identifies the major changes which are currently revolutionizing the world – the collapse of Communism; the electronic revolution and its impacts on the structures of industry and, in due course, governments; the emergence of the 'knowledge' economy as the leader in GNP and jobs; and the first commercial applications of gene transfers. All of

these are having major impacts on people, their societies and economies. The speed of these changes, their cross-interactions and the uncertainties which these are creating have sparked fears in the hearts and minds of millions of people. These in turn have been expressed by their most volatile members - adolescents and teenagers - virtually everywhere, as well as by other people facing ill health, job loss, the impact, real or imagined, of displacement by immigrants from other countries; the effects of continuing economic depression; and the apparent inability or unwillingness of politicians to listen or to face up to the reality of rising taxes 'squeezing' already diminishing or vanished incomes.

6. These fears are expressed in a rise of violence, aided, abetted and promoted by television, magazines and movies, rape and brutality against women and children, ethnic and racial wars of the most bitter type, sometimes aggravated by religious difference, excessive emphasis on sex from cradle to grave, random killings, muggings, etc., reported in detail with pictures and columns by a press which sacrifices any moral doubts or national responsibility or the sales which economic theory and competitive markets now 'demand'! Is it surprising that the environment, human satisfactions, society itself, and, even peace seem to be taking second place?
7. No report which reaches out to the year 2020 can be valid that does not deal with these basic human and social causes and their effects. The treatment of human resources has traditionally attempted to reduce and control human affairs to a single parameter - prices for everything and everyone established in free markets. This is the claim and the aim of neoclassical economics. But, in making this claim, it is also assuming (or trying to establish) that humanity itself can also be given a price provided that the market for 'humans' is free. This 'heresy' (which denies our embeddedness in nature and our fundamental needs vis-à-vis-each other actually has not been successful.
8. We thus arrive at the new order: the world economy based on sustainable development in which both capital and current expenditures are accounted for (despite certain technical difficulties at this stage). The means to accomplish this is now beginning to exist. A further prerequisite is that of maximizing human activities by creating not just a resilient sustainable economy but a sustainable environment as well. We can then correct the neoclassical model in which new industries create new jobs but, as they develop, start to erode them by requiring further technological sophistication to increase productivity. The environment, on the other hand, has the opposite characteristics - the maintenance of diversity at both the micro and the macro scale; and, it is through this aspect that more employment of and by human beings may be secured in the future.

9. A major Canadian contribution to world affairs occurred when Lester Pearson proposed "Peace-Keeping" to help end the Suez crisis in 1956. This has stopped violence on the island of Cyprus for 28 years. But, it did not and could not resolve the underlying racial conflict. More recently, "Peace-Making" has been tried in Iraq and in Somalia, but not so with success expected. It may therefore be opportune for Canada to propose a natural extension: "Peace-Building"!

Climate

10. Historically, in relation to other planets, our natural climate, governed by the sun, the earth's orbit around the sun and the complex interaction of the atmosphere, the oceans and the polar regions has been remarkably stable and within the relatively narrow temperature range required to sustain life. However, in recent years, there has been an increasing awareness of the impacts of weather and climate on mankind. The general but unusually severe winters in the eastern half of the United States and northwestern Europe, drought in the Sahel region and in Central America, poor monsoons in South Asia and increased frequency of record cold temperatures in midwestern United States have focused world attention on climate. As a result, the scientific community has been besieged with requests for definitive answers to futuristic questions concerning climate change and the possible effects change could have on agricultural productivity, ecology, energy consumption and human health.
11. There are many different views on the future of the earth's climate. the most popular forecast is that the Greenhouse effect will warm the atmosphere .3 degrees C per decade. Currently, the industrialized nations are the major Greenhouse gas producers, but as we become more conscious of the problem and implement solutions, the developing nations will become the dominant source of these gases. Sources indicate that drastic changes are not currently expected by the year 2020, however, if the trend is not reversed, areas of drier soil, depletion of ocean fish stocks and other natural resources, could have adverse global effects by the middle of the next century.
12. There is much talk about new technology being able to support the climate control, and while it is agreed that some form of it is inevitable in the future, actual implementation will remain cost prohibitive well beyond the year 2020.

Environment

13. Although there is continued support for more stringent environmental standards, current trends indicate that the movement does not have the strong support that existed a decade ago. Future trends indicate that governments, institutes and special interest groups will continue to press for improved environmental controls and tougher

legislation. However, a truly effective and radical "Green Plan" may prove to be cost prohibitive as it is doubtful that the industrialized nations will readily accept the required cuts to social programs and government services to provide the necessary funding. Later developing nations do not have the funding nor the conviction that they are part of the problem.

14. Should the current pace of change remain constant, we will see minor improvements to industry emissions, more reforestation, reduced ozone depletion, and increased usage of alternative fuels over the next thirty years. An increase in global support for environmental projects would result in vast improvement in reusable fuels, environmentally friendly transportation, shorter timetables for the elimination of ozone depleting material usage, cleaner air, purer water and replenishment of renewable resources.
15. A "Global Environmental Partnership" is a desirable goal, however there are some serious obstacles in the way: increasing populations in areas that can not easily sustain the growth; a widening gap between the "haves" and the "have nots"; and a lack of important education standards in many areas of the world.
16. Establishing a "Common Heritage of Mankind" wherein the human species adopts a new attitude toward the environment is the thrust of many organizations and institutes throughout the world. The emphasis is on developing new benign lifestyles, by both individuals and institutions, accepting responsibility for the environment and, above all, on behaving in ways that recognize the need on the part of all human societies to care for the life-support systems of the planet. It will require tremendous political will on the part of all nation states to effect success.

Technology

17. Science and technology will bring new opportunities to the profession of arms in the evolution or improvement of weapons systems, and military organization and training of men and women. To be aware of these highly probable trends in science and technology is to recognize that opportunities for imaginative new force development models, new weapons systems, and new logistics systems and communications, are at our fingertips. The new technology will have a dramatic effect upon military firepower,
18. mobility, communications and electronics, as well as upon levels of comparable vulnerability of attackers and defenders. It will affect the capabilities for surveillance, and the maintenance support and logistics systems of military forces. These changes will interact with each other to facilitate dramatic growth in operational capabilities. The technological and procedural changes

will be holistic so that all military activity will be drawn to a total change in its attitudes towards management, development, acquisition, and uses of hardware and software.

19. The rate of technological change combined with changing public attitudes toward public accountability, and the transparency of management decision making will create levels of challenge to our defense spending process not heretofore experienced. The military of the future must be seen to be responding quickly and adequately to technological change while assuring the Canadian public that it is worth its cost in competition with other political and social demands for tax dollars. Attitude and purpose will be vital to our acceptance or rejection of the key findings of the Technology Working Group.
20. It is perhaps the categories of Knowledge Based Systems, Robotics and Information Processing technologies that will have the greatest impact on the majority of people in the shortest length of time. For it is really the acquisition, processing and dissemination of information that determines the speed and accuracy of command decisions in times of peace, increased tension or actual conflict.
21. Miniaturization of electronic components and costly increased computer capabilities will have a dramatic effect on virtually every area of military activities Manned and Unmanned systems design, surveillance and threat analysis, weapons systems, communications, military command and control, self diagnostic maintenance systems, and military occupational structures

Economics

22. Much literature of the last few years suggests that the science of economics has become somewhat discredited. As the well-designed, well-built utilitarian guide of the industrial age, it has served us well in the two hundred years since Adam Smith wrote the script for the age of industry. We, in North America, have been the undoubted material beneficiaries. But now, the new economists say, that industrial age model is slipping away. We are being overtaken by the Information Society. So it is that banking, as we know it, seems ill-equipped for the demands of the new economy; information is wealth and money banks will tend to look more and more like information banks if they are to survive the transformation. The national economy is contracting; the cost of money makes saving, "conserving", more profitable. The unofficial economy of barter and local community service is growing and will likely continue to grow. We are moving into an era of "disintermediation" and of less government-dominated production of social goods and services.
23. In this new economic view of the future, small is beautiful, and automakers and new oil companies and the

great mineral extraction and processing companies struggle to downsize, diversify or die. Some mass markets are shrinking or are coming to an end; steel, hydro-electricity and automobiles are said to be at a saturation point of their exponential growth. The oil bubble is, many sources suggest, close to bursting; new fuels – usable hydrogen fuels – are perhaps two decades away. Who wins if so-called third world economies cannot pay their debts? Debt restructuring or debt repudiation either within nation-states banking systems or nation-states in the global economy, are envisaged.

24. Government is going out of business; the new economists say we will be under pressure to de-regulate as well as sell off air lines, telecommunications systems, railroads, even the national broadcasting network. Government too at municipal, provincial and federal levels will, it appears, become an information system rather than a manufacturer or expensive service. Services will be more local in their manufacture and delivery; taxpayers will audit them.
25. The main conceptual and analytical issue that must be faced is that the economic analysis required for the year 2020 may be falling between two paradigms. At a minimum, the prolonged recession complicates the outlook. The dominant paradigm remains vigorously wedded to the economics of the industrial order, but is showing some cracks and strains. The emerging paradigm, in the view of many, is keenly following the progress and rise of the "knowledge-intensive elite", but its hypotheses and measures are still quite loose and speculative. So the main issue will be, what "economic reality" to use to describe the future and the trends leading to it?
26. World population growth will be one of the major determinants of this economic reality. Sources generally agree on a consensus view which puts world population at around 8 billion by the year 2020 is used. The present world population is about 5.5 billion, having grown from about 1 billion 150 years ago. About 91 million people are now annually being added to the world population. The projection adopted here is consistent with a stabilizing population at 12 billion by the end of the next century. There are, of course, alternative population projections, varying from 5 billion to 30 billion over the next 100 to 150 years, but these are not considered here.
27. In assessing Futures, it is useful to think of a hierarchy of risks. There is a growing awareness, based on scientific knowledge, that human behaviour can seriously restrict, and perhaps, even destroy the earth's carrying capacity to sustain human life. At the ecological boundary, the risk is to the human species. Humans organize themselves in social units, in part, to give expression to social values, but also to influence behaviour. Those societal entities can themselves be at risk. Failure to manage risk at this boundary can be remedied through social change, even of

cornerstone institutions and the ways in which societies organize themselves.

28. One means of social organization is the economy (another is governance). The economy is contained within society and therefore within ecosystems. It operates within a given set of social values to allocate scarce resources to generate wealth, normally using money as a common measure of value. At this boundary, a failure does not necessarily mean that all the elements of society are at risk because economics can undergo fundamental change.
29. The common structures of economies are not working at all well. In addition to the obvious economic failure of the Communist system is the former USSR, common property resources are being seriously mismanaged. Included in common resources are the fishery, overly used ecological sinks, the ozone layer and the air purification systems inherent in the world's forest resources. A significant shift in social values that will foreshorten the "Futurity" of the "Present" involves the emergence of a global environmental imperative.
30. While the new economics, currently being developed by various economists, accepts the role of the price system in clearing markets and allocating resources, albeit with some taxation policies to reflect externalities not captured in private costs, it finds many of the other tenets of neoclassical theory to be lacking. Models of the new economics during periods of emerging new techno-economic paradigms differ markedly from their neoclassical predecessors. Unlike the neoclassical view of the economy where the symmetry of the models, founded in calculus, provides for reversibility, shifts in techno-economic paradigms gain their own momentum. The underlying forces for change are sufficiently strong to be irreversible. The new paradigm may be characterized by: knowledge-based production; falling costs of transport, communications and data processing; and flexibility and decentralized global and regional markets. Innovation is becoming increasingly science based which implies a shortening of the product cycle, more "up-front" costs and riskier innovative activity. Nations and regions are acquiring comparative advantage through the acquisition and development of technologies and skills rather than relying on their natural endowments. Accordingly, human capital and activity are very important elements in this new economics.

Societal/Political

31. Society does not yet appear to have conceptualized a means to measure the rate of change or to evaluate the gains and losses that will accrue, as the industrial resource base shifts from non-renewable materials to limitless knowledge. But society is rapidly becoming aware that constant change is a reality for the foreseeable future and that all human activities are likely to be affected over the

next few decades. During this period of uncertainty, the sources indicate, there is within democratic countries, a resurgence of interest in the welfare of others, a closer identity with the local community, a strong demand for greater accountability of public expenditures and an intense questioning of moral and ethical values.

32. As the information age develops, it will affect fields of work and education and provide for new forms of economic resources. The advent of the "information highway" will pose significant problems in the areas of regulation, control and ethics. If the correct choices are not made, abuse of the system and new forms of criminal activities are likely to arise.
33. Social stratification caused by demographics, employment opportunities, education, and access to new knowledge, technology and communications could result in social unrest and regional conflict. Personal concerns and perceived needs for physical home and business protection will grow.
34. Loyalty to a particular firm for the duration of an employee's career is giving way to personal loyalty and needs taking precedence. Human interaction skills will become very important for managers to keep subordinates motivated and productive. Client responsive, organizations with "flat" vice "hierarchical" structures will be the survivors of the future.

International and Military Affairs

35. International security is measured primarily by the absence of conflict between nations. It is not enough for a nation to itself avoid conflict because its international relations and trade agreements could well be affected by the existence of conflict in the one or more nations with which it has relations or even by conflict between third parties.
36. In the period 1496 B.C. to 1861 A.D. (3,357 years), there were 227 years of peace and 3,230 years in which wars were fought; a ratio of 13 to 1 years of war to each year of peace. To compare those statistics with more modern times the report examines the incidence of conflict over the past 250 years. There has in fact been an increase in the number of conflicts in progress simultaneously in any one year throughout the world. The number was about 12

per year over the nineteenth century and up to World War II after which it increased rapidly and seems to have settled down at about 40 per year over the past few years. The number of new wars per year is not high, but the number in progress at any one time is on the increase, mainly due to the extended duration of conflict in modern time. In many countries a state of conflict has existed for decades without any sign of a final decision being reached. Ireland and Lebanon are two examples of protracted conflict. The probability of long duration conflict is greatly increased by the informality of present day warfare; there is seldom a formal declaration of, or a formal conclusion to, modern day conflicts. When one side appears to be losing, it resorts to terrorism, recruits new combatants and continues to fight. Interestingly, it appears in modern conflicts there is a much reduced chance of the initiator achieving outright success. For the period 1800 to 1900, initiators won approximately 66% of the time but for the last eighty-five years, initiators have won or appear to be winning only 30% of the time.

37. The research from a wide variety of sources, would indicate that it is imperative that we understand that economic security cannot be achieved by concentrating on sovereignty protection at the expense of international commitments. In other words, it is not enough to "stand on guard for thee"; the price of liberty cannot be paid solely within our own borders. That is not to say that we should not support genuine peace seeking efforts, but it is to say loudly and clearly that through alliances we must be equipped and ready to resist ideologies and movements that promote expansionism and terrorism, and all liberate attempts, however inspired, to upset international stability. It would seem that the trends of the future are away from narrow nationalistic perceptions of sovereignty, rather the world is seeking a rational perspective and concern for the perceived interests of others.
38. Canada is unlikely to have a positive and constructive influence on international matters unless it is strong economically, militarily, politically, and has a proven record of contributing to all initiatives aimed at promoting global justice and stability. To accomplish these aims Canada will need military capabilities and the resoluteness to assign them to any geographic location threatened by force, terrorism or subversive activity.