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THE POLITICAL AND ECONOMIC PROSPECTS OF THE JET AGE

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THE Sputniks and their successors have, in a remarkably short time, rubbed much of the glamour off the dawning jet age. Mankind has become so intrigued by the hasty sight of hardware revolving about the earth—and the implied promise of space travel in a generation or so—that the idea of riding only eight or nine miles up and at a speed of only 600 miles per hour seems somehow to have lost much of its thrill.

Yet for this generation and, very likely, for the one which follows, the jet age may do more to change the circumstances of men and society than the accomplishments of astronautics.

What will this jet age bring? What will its impact be on the using public, on the carrier, the supplier and the other people who will live on this earth during the years in which air transport turns over to the greater speeds and higher altitudes of turbine power?

As the first party in interest, the air transport industry has generally been too preoccupied with the actual fact of conversion to explore its other facets. Few others have interested themselves very deeply in the subject. It is one, nevertheless, which seems to demand an exercise in what Jan Christian Smuts called "wholism"—an attempt to see this new technological revolution in aviation in the whole context of human activity.

This is an exercise which must be approached with some humility, because it constitutes merely the opinions of one man (and practically a layman at that); and with a good deal of caution, because prediction in aviation is a notoriously heady wine.

One pioneer—in aviation if not in prediction—once confessed that in thirty years of reading the future of flying, he had been wrong only when conservative, and that what he had thought were his wildest guesses had turned out to be his most accurate. We seem to have progressed technologically to the point where we have fulfilled, or feel reasonably certain that we can match, virtually any of the forecasts of purely physical performance in the air which have engaged the minds of men since time immemorial. If we can read anything from the past record of prognostication, it is a warning that we must not consider that anything is impossible.

There is another, and perhaps less obvious lesson to be read from the past. That is not to put any absolute time limit on predictions. Time factors can be immensely variable. The fulfillment of Isaiah's vision of aerial armageddon waited for twenty centuries; yet fifty-odd

years after Kitty Hawk, we are flinging satellites into the world beyond our own. The modern concept of the "crash" program of scientific development and the ever-present possibility of the sudden and dramatic break-through are pitfalls for the prognosticator.

The Context of the Jet Age

The more we consider the future of aviation—and this might indeed apply to any other scientific development—the more we become aware of the great and possibly fatal discrepancy between man's mastery over things and his mastery over himself. This is not merely a pious observation. In any consideration of the possible developments of the next few decades, it is a very serious question; if the physical forces we can now manipulate should be unleashed, mankind has no future on this side of the next life. The fact that this is written at all is an indication of optimism, a hazard that the world as we know it will not come to an end in our generation. However, it is tempered by a belief that we will not achieve the millenium in our lifetime, and that we shall have to live—if not with big hot wars—with little and cold ones, and the threat of something worse.

We must recognize as well that regardless of how much it may preoccupy our attention in aviation, this jet age will not develop *in vacuo* and that it may not be the decisive, or even the predominant influence on our era. The world is also entering—and in some cases is already well on the way through—other "ages" in whose context civil aviation must play its part. This is also the atomic age, the age of automation, the age of electronics, the age of miraculous medical discovery—from all of which may stem new conditions which could considerably alter the circumstances of air transport.

At the same time, we can not separate the jet age from older and deeper currents of contemporary history—from the problems of overpopulation, from the attempts to raise standards of living and to expand the sphere of human activity in many fields, from the rise of new nationalisms and from the attempts to bridge the barriers between old ones.

There are two other imponderables which should be mentioned. The first is the ever-present danger, not of inflation, for that has been with us for a long while, but that inflation may get out of control. One cannot but feel a very great deal of sympathy for the airline president who ten years ago predicted air travel at three cents a mile and who has today been forced to ask for a fare increase from a considerably higher figure. He was not wrong; and his faith in the potentiality of his aircraft and his staff has been fully justified. But look at what has happened to the penny in the meantime!

Finally, we do not know how the world's resources of scientific and engineering talent and its supply of capital investment will be shared out at any given time between all of these new areas of development which clamor for attention. We have learned in the past few years that

these resources are not inexhaustible. All countries are hard pressed to find a sufficient supply of men to practice all of the skills which we have discovered. In air transport we are going through a period of re-equipment and expansion which has already multiplied several times our accustomed capital requirement; and we are discovering that large amounts of new money are not always easy to get—whether from the state or from private investors. This applies as well to investment in the infrastructure of airports and aids, as well as in the fleets and establishments of the airlines.

This is all by way of explaining why this prognostication is rather cautiously undertaken and why it will avoid statistics. This can be only a rather general survey of the subject. It cannot pretend to be a definitive study or to report firm conclusions. The most one can do at this point is to draft what might be considered as a memorandum of instruction for a team of engineers, economists, demographers, geographers, political scientists and other specialists about to undertake a serious study of what the jet age may mean to mankind.

Definitions and Assumptions

One starts, of course, by defining terms. We shall reckon the jet age to be that period in which the bulk of air traffic will move in turbine-powered equipment. The turboprops are leading the way into it now; we should be well over the threshold in another two years; and the conversion to turbine power should be reasonably complete, at least on the main world routes, by about 1964. It may maintain its presently foreseeable characteristics for perhaps an additional 15 to 20 years during which we will have attained a plateau of development. It may be followed by another great advance in speed into the supersonic range, or it may be succeeded by an age of atomic-powered aircraft which might revolutionize the economics of civil aviation even more completely. Perhaps we shall have both supersonic flight and a cheaper form of power as well.

We must also take into account certain other developments which are likely to take place within the framework of civil aviation during this age—in particular the possibility that we may have helicopters and other forms of VTOL and STOL aircraft whose capacity will be great enough and operating costs low enough to change the patterns of feeder and service flying within the world network.

One must also make certain assumptions. The primary one, of course, is that there will, by and large, be peace during this period. At the same time, we might assume that there will be sufficient uneasiness in the world to justify a continued, although perhaps somewhat reduced investment by government in those military installations, manufactures and developments from which civil aviation reaps much benefit, or which would otherwise have to be financed out of the budgets—public and private—of civil aviation itself.

A further assumption is that the process inflation will not get out

of bounds, at least to the extent that the balance between the costs and earnings of civil aviation (and the living costs and the earnings of their customers) will remain in reasonable adjustment.

Finally, one must assume that the distribution of responsibility for the various phases of civil aviation as between governments and operators will not alter in such a way as to throw on any party new tasks which it could not afford to undertake; and that all parties to the present distribution will be able to keep the same pace in the carrying out of these responsibilities. In other words, we must assume that the aids and facilities needed for efficient and economical jet operations will somehow show up at the right places and at the right times.

The Effects of Speed

Now we can count on the vehicle of the jet age to differ from the present generation of aircraft in two essential respects—it will increase the speed of air transport by about 40 per cent, and it will increase its capacity and productivity many times over. We know that the costs of operating these new jets will be much greater per aircraft kilometer or per aircraft hour, but that theoretically, at least, the cost per passenger kilometer and per ton kilometer should be less than they are today.

The prospect that they might not be less is what keeps airline managements from sleeping as soundly as they might. But the assumptions stated above seem to be very generally shared by governments as well as airlines, so that there is a sufficient foundation of hope, faith and experience on which to base forward planning.

The consequences of greater speed have already been subject to many interesting and amusing studies which the reader has probably seen. Yet speed has significance only when it means something within the context of human existence and when it can be related to the experience of the average man. It is all very well to point out that the jets will be able to fly around the world in 48 hours. Nevertheless, one might remember that it is possible on today's piston-engined schedules to do so in the very good time of eight days and that one Detroit journalist who tried it as a stunt could only conclude that the world might be a wonderful place to visit, but he wouldn't want to live there.

Therefore let us consider the jet age in these terms: that in a jet transport, the English channel is now no wider than a good sneeze; that one can fly across Belgium at its widest point in no more time than it takes to smoke a leisurely cigarette; that London is as close as Montreal by jet as it is to Edinburgh by train; and that in flying from Frankfurt to New York one must look quickly in order to see Holland at all. Speeds of this order will be immensely important—when they are offered by common carriers, on regular schedule, and are available to anyone at any airline office or travel agent for a stated and not too unattainable amount of money.

The political consequences of this fact are obvious. In the perspec-

tive of these speeds, the watertight compartmentation and tariff walls of this continent of Europe lose sense or justification.

By the same token, relationships between more distant nations become closer. Isolation as a foreign policy becomes less tenable than ever. Above all, it becomes impossible to keep any people in ignorance of what is happening to other peoples elsewhere in the world.

The Question of Capacity

How far this process will go depends to a large extent, of course, on how far it can be extended in terms of numbers of people and tons of goods—in other words, in terms of how far this new mobility can be conferred upon the whole community. This is where we come to the question of capacity, although one must hasten to add that the offering alone will not determine the extent of use. There are presently some 300 turbine-powered aircraft on the order books of the principal manufacturers of the world. With their greater carrying capacity and their ability to operate over a given route with greater frequency in the same period of time, these 300 aircraft will just about double the capacity of the existing airline fleet. These orders are only a beginning. Many airlines have yet to place orders for the aircraft they will need for the first step into the jet age; and the industry has so far been preoccupied with jets of the largest size. How far the process of re-equipment will go before the saturation point is reached is still a question, the answer to which depends to some extent on the market itself, on financing and, as well, on what new types and sizes of jet aircraft may be on the drawing boards. As an indication, however, one recent survey indicates that over a period of years the United States airline network alone can absorb 500 of the largest jets, in addition to many smaller turbine-powered types.

The Need for Bigger Markets

The existence of such vastly increased capacity—even on the scale created by the initial orders of the industry—can only mean one thing: that air transport must penetrate more deeply into the potential market and draw its traffic from those wider areas farther down in the classical economic pyramid. Some of this greater traffic will of course be generated by the new usefulness which greater speed will itself develop, but the bulk of it must eventually come from lower fares and rates.

It is difficult to say now to what point fares can be brought down and how quickly these decreases will come, for the industry still awaits some of the answers to their own questions about costs of jet operation. And it would be well to say that future reductions in air fares should not be measured particularly against their present levels in units of currency, but against the comparative costs of other commodities and services and the size of the average pay envelop at any given time in the future. But the reductions must come.

There will, of course, be some increase in the amount of business and government traffic in the years to come. We can also look forward

to greater immigrant traffic—about which I shall have more to say later. But the fact remains that the bulk of the new traffic of the jet age must come from increased tourism.

An Explosion of Tourism

If the world can continue its reasonably steady, if somewhat erratic, postwar progress toward greater and more evenly distributed prosperity, it should be entirely receptive to the jet age. There is a trend toward shorter working hours and longer paid vacations, coupled with the spread of pension plans and other forms of social security for the aged. There is also the increasing tendency of modern man to regard himself as essentially a mobile animal, rather than one tied for his whole lifetime to a certain house on a certain street in a certain town.

These conditions do not exist in all countries or to the same degree in any two. It is still, unhappily, a waste of time to talk about air travel to people whose major preoccupation, 24 hours a day, is to get enough to eat. But such conditions do exist in North America; they are certainly coming into existence in Western Europe; and they are evident in certain other countries as well. Little by little, the upward trend in the standards of living in many countries is approaching the descending curve of airline fares, and when they meet there will be an explosion of tourism such as the world has never seen before.

Ten years of postwar experience in tourism have amply demonstrated its enormous implications. Even today, when we have tapped only a small fraction of the potential tourist market, it has become one of the indispensable elements of many national economies. Its consequence to Europe has been well advertised; and it is of at least equal importance elsewhere in the world. Only a few weeks ago, Mexico estimated that tourist traffic brought more than 500 million dollars into the country in 1956. A single province of Canada, and not one of those with the widest and longest established appeal, earns almost 30 million a year from its tourist trade. Whole areas of the Caribbean have taken on new life and promise as a result of this tidal wave of tourism.

It would be a mistake, however, to regard tourist traffic as self-generating, or to consider that one need only wait for the airlines to reduce their fares in order to have tourists clamoring at one's doors. Governments and the other elements of the travel industry will have to increase their efforts to attract this new traffic and to give it the kind of accommodation and services it requires. The tourist is exigent, and he has every right to be: his few weeks of vacation and the money he has saved up for it are more personally precious to him than the time and money of the habitual first class traveller. He is also more influential, because there are many more like him in his own family or social circle who will be profoundly influenced by what he has to report.

Moreover, the tourist of the jet age will have a very great deal of choice: the fact that one resort is 500 miles further away than another

will have little significance in the new age. At the beginning of this generation in the U. S., the normal scope of a vacation covered a radius of about 75 miles, in which we were fortunate to have a choice of mountains and seashore. In those days—which were not so long ago—a trip to Yellowstone Park or a voyage to Europe was a once-in-a-lifetime affair for most, and a vacation in Florida was something for the rich or retired. The picture has entirely changed today and it will change even more tomorrow. Intercontinental travel is now a habit for some, a realized aspiration for many more and a bright and tangible hope for even larger numbers. If these people cannot find accommodation on one continent, there are always others. This is not necessarily confined to the American tourist market: in the jet age there will be as many German tourists in Beirut and Marrakesh, and eventually in New York, as there are this summer in Venice or Paris. And this tide of tourism should roll from many centers in many directions. The jet age may well see Tahiti the equal of Hawaii, and the resorts of the Andes as popular as those of the Alps.

Because it comes from a different economic level, this new traffic will require different kinds of accommodation than those which the majority of European tourist centers offer today. As a stock in trade, the new tourist will represent a quicker turnover, for the first time tourist, at any rate, wants to “do” as many places as he can in the course of his tour. He may, initially, be less attuned to the nuances of other cultures and a bit more impatient with what is unfamiliar. He will represent a challenge to capital and to understanding, but he will, if properly treated, pay excellent dividends in both respects.

The Immigrant Traffic

Both on a scheduled and a charter basis immigrant traffic already takes up a substantial portion of the available space offering of the industry on a number of routes, not only out of Europe to North and South America, but also as between Europe and Southern Asia on the one hand and Africa on the other. Although the greater part of that mass of persons displaced by the war has, over the past ten years, been resettled, there are still many countries whose populations are too large for their resources. The potential continuing migrant traffic is a large one.

Here again are other factors which should work in favor of the jet age. Civil aviation itself is enlarging the habitable area of the world by bringing into the orbit of civilization vast territories which have hitherto been too remote, or too difficult of access, to encourage settlement. Lands which have lain fallow and unoccupied because mountains, rivers and jungles have barred them from exploitation from without, or prevented them from finding markets, are now coming into the main stream of commerce and transport through the air. Other places which have offered opportunity, but which cannot of themselves supply the essential comforts and amenities which man requires, can

now be supplied by air on an economical basis. Climatological change is also in our favor: we are apparently going through one of those cycles of climate in which the globe is warming up. The arctic, with its great stores of natural resources, has lost its forbidding look. In the last 50 years, the climate, the economy and the ways of life of Southern Greenland have undergone almost unbelievable change; and in Canada and Siberia, whole new communities are rising and crops are being gathered on what was bleak, forbidding tundra in our fathers' day.

These should not be the only consequences of immigrant traffic in this new era. There is a significant difference between the immigrant of a generation ago and his counterpart today. In the days when migration by sea involved weeks of discomfort or worse, pitching and tossing in the steerage of a ship, the emigrant was prone to consider that a door had shut between him and the country which he had left. Only a comparative few, largely from areas in which it was the tradition to go abroad to earn a competence to be spent back home, ever had sufficient curiosity or desire to take them back to the land of their origins, and not all of these could spare the time and money involved. Emigration today is quite another thing—in many cases, there is only a night's sleep between the old country and the new. The immigrant of tomorrow will be likely to cherish his ties with family and friends in the land of his origin and to feel that he can easily go back and forth to heed the call of sentiment and kinship. In Canada, for example, the postwar immigrant of a few years ago is already a recognizable contributor to the round trip transatlantic traffic of today.

Cargo Potentials

So much, for the moment, for the passenger traffic. What will happen to cargo? Probably the same thing, and perhaps in even greater measure. Not only will the jets offer more capacity in their cargo holds, but in the process of changeover, large numbers of piston-engined aircraft which are by no means operationally obsolete will probably be turned over to cargo traffic. The result will be an even greater increase in cargo capacity than can be foreseen for passenger services. The kind of cargoes which we are moving today will come nowhere near filling this available space, and whilst a good deal of this capacity will be soaked up eventually in services to areas which must largely be supplied by air, carriers will have to fill their holds with varieties of freight which they seldom, if ever, handle today over the principal trade routes.

This will not be a simple process. The annual rate of increase in cargo traffic is lagging behind that of passenger service; and the disparity between future supply and existing demand may grow larger over the next few years. Inevitably, there must be a re-evaluation of cargo rating and, as the new capacity becomes available, a considerable reduction in the levels of rates themselves. Nor will this alone be sufficient. For their new cargoes, the airlines must look to commodities which have moved through established channels of surface transport

for centuries. Many of these commodities will not be economically transportable by air in their present type of packings, or in their present bulk, or with their present frequency. To get at them will require much research by the airlines themselves into markets and packaging and into habits of inventory and supply. It will also require a great deal of education and promotion, for the commercial community which controls the movement of these commodities is by and large a conservative one which is not easy to persuade and even more difficult to change.

Yet this will have to be done; and when it is done the cargo traffic of the jet age will have us counting our tons carried, rather than our ton-kilometers, in units of millions. The airlines may not, in the period of this forecast, be freighting wheat, cement, ores, lumber or locomotives, but in another decade they should be carrying virtually everything else—great quantities of manufactured and semi-manufactured goods, large items of mechanical equipment and so on; in other words, just about everything between whisky and bulldozers, in addition to their present cargoes.

One should not, of course, overlook the probability that certain present trends in air cargo development will continue and become intensified in the jet age, not only as a result of faster and cheaper service, but also because the movement of populations will create new islands of demand dotted around the globe. The amount and variety of perishable foods and flowers carried should increase considerably as costs go down and as the range over which these can be carried in good condition increases. In many parts of the temperate zone, a generation ago, oranges were a very special fruit, available in quantity only for certain holidays. Today, citrus is a staple of the diet of millions of people, hundreds and even thousands of miles away from the sources of supply. They are not, of course, carried by air to any appreciable extent, and their present easy availability has been due to the development of refrigeration. But the speed of jet service may well be to other foodstuffs what the refrigerator car has been to the citrus crop. It is not beyond the realm of possibility that we in the temperate zones will in a decade or so see the papaya and other exotics pretty regularly on our breakfast tables. By the same token, of course, peoples in the tropics may well be eating fresh corn on the cob, and northern fruits and vegetables with the dew practically still on them. The same will apply to meats and dairy products in areas where cattle do not especially thrive, as is already the case in Algeria, where fresh beef, butter, cheese and milk are freighted in nightly by air from central France.

Changes in Industrial Patterns

To meet the special requirements of air shipment, of course, the method and locale of the processing of these products may well change. Because air shipment dictates the elimination of unnecessary weight, the jet age will probably create a demand for processing plants in many places which currently ship their produce out uncleaned and in bulk.

New forms of containers will be required. Wholesalers and retailers may have to change the rhythm of their activities and their methods of merchandising, and the routes of food supply for many cities will as often lead to the airport as to the harbor or the railway terminal.

Similar changes can probably be expected in other commodities as well. In an era when sources of supply will never be more than a few days, and most often overnight, from the point of sale and service to the consumer, the present tempo of manufacture may undergo very substantial changes. It will no longer be necessary to stock several months' inventory of products or parts. Manufacture itself can be paced more closely to consumer demand and patterns and packages may be changed more rapidly to accord with shifts in the public taste. These developments will in turn have their repercussions on the whole complex of suppliers to the industries affected.

Again, the more widespread distribution of population groups will generate new cargo demands. Man changes his location much more easily than his tastes and habits; and he is anxious if he cannot have where he is the things which he liked and had in the place which he has left. Any country from which there is a substantial amount of emigration may look forward to new markets for many of its products, its newspapers and its books in the new areas to which its people go.

New Demands and Facilities

We have so far been looking at the prospects of the jet age largely in terms of the volume and variety of air traffic. Will the requirements of the airlines themselves have repercussions in the industrial and other fields? The probable answer is affirmative, although it is difficult to say to what degree. The demand for fuel and lubricants is certainly due to increase and the pattern of their distribution will change as the traffic pattern alters, adding stops in newly developing areas and possibly dropping certain others in favor of non-stop operations over some routes.

In similar fashion, increased volume of air transport will mean greater demand for all of the products and services which an airline puts together in the fabrication of an available ton-kilometer of transport. Important as these may be to individual suppliers and to a growing number of employees in the airline industry, however, it is probable that the principal economic effect on world economy of air transport, as of most service industries, is to facilitate and intensify other activity.

There is perhaps one exception to this, in the field of electronics. Air transport is already increasingly dependent on a wide variety of electronic devices for communications, air traffic control and navigation and other operational purposes, and for some of the more complicated phases of ticketing, space control, accounting and planning. The need for these electronic aids is certain to become intensified as more and more jets are mixed into the present stream of traffic, as they penetrate new operating altitudes, and as the flood of traffic on them rises. This is

not merely a demand for greater numbers of existing systems, but for new kinds of systems and devices, whose usefulness almost certainly can be extended to other purposes besides civil aviation.

Political Consequences

Little has been said so far about the political aspects of the jet age. This has been purposeful, for it is a risky business to outguess an electorate. However, there are certain things which one can attempt to predict about the political climate as it may be affected by the jet age; because the economic and sociological changes it may work will certainly change the context of many political situations.

Assuming that the developments discussed do come about, we shall see in the next two decades a movement of people, of goods and of ideas between the continents on a scale unprecedented in human experience.

Culturally, its impact should be at least as great in many areas as was the effect of the Crusades upon Western Europe. New cultural strains will be planted in new environments, or will be grafted on to others of earlier settlement. They will probably be stronger in a way than those of earlier waves of immigration because they will have closer and easier bonds with their source of origin. Yet there will be a greater mixing as well through tourism and, no doubt, through a growing tendency to include at least some months of study abroad in university and even high school curricula.

Economically, the jet age should operate to increase commerce and quicken the pace of industry. It should not only contribute to higher standards of living and to an expansion of the world's supplies of food and essential goods, but it should intensify the inter-dependence of nations.

In terms of political atmosphere, the effects of this process should be equally significant. It may be too much to expect that the jet age will work any miraculous change in the human animal, but it should help to make him more literate, more sophisticated and more cognizant of what goes on around him. I hope and pray that there will be no weakening of those qualities which make national identity and culture things to be cherished, but there must inevitably be a filing down of the sharp edges of nationalism on which man has so often and so badly cut himself in the past. Our conceptions of sovereignty will perhaps change little in 20 years, but the expressions of it may change much. Certainly, there will be little justification for elaborate frontier procedures when air traffic moves people and goods about in the same volume and with the same frequency as a municipal tramway system.

In some places, these developments will have their effect on domestic politics, particularly as a result of large scale immigration from new and, so to speak, non-cognate sources. New countries may therefore undergo the same experience of absorbing new elements into the body

politic, or working out methods of co-existence which we have already seen in the United States and Canada.

It will also be increasingly difficult to shut whole populations off from any knowledge or understanding of main currents of thought and development in other parts of the world and this fact, too, will have an effect on the internal affairs of nations.

Principally, however, the political effect of the jet age may be felt in the international field, and will stem from an increased awareness among peoples of their common problems, common lot and common aspirations—and from the common realization that mankind must learn to live in harmony or die in concert.

Having warned myself of the dangers of drawing any conclusions from a survey which must necessarily be only a hasty one, the writer will not do so. But it might be helpful to summarize to this extent: that provided there is no war, provided there is no marked deterioration in the economic health of the world, and provided the conditions exist which will make possible the operation of jet aircraft at their optimum economic efficiency, mankind can draw very substantial benefits from the jet age.

The preliminary provisos may seem formidable, but they represent the three great questions which have hung over the head of air transport since it began in 1919. The fact that it has survived, improved and extended itself, despite serious disruptions, is the best reason we have for believing that it can continue to do so. And if it does, the jet age should help diminish the threat of war and improve the condition of man.