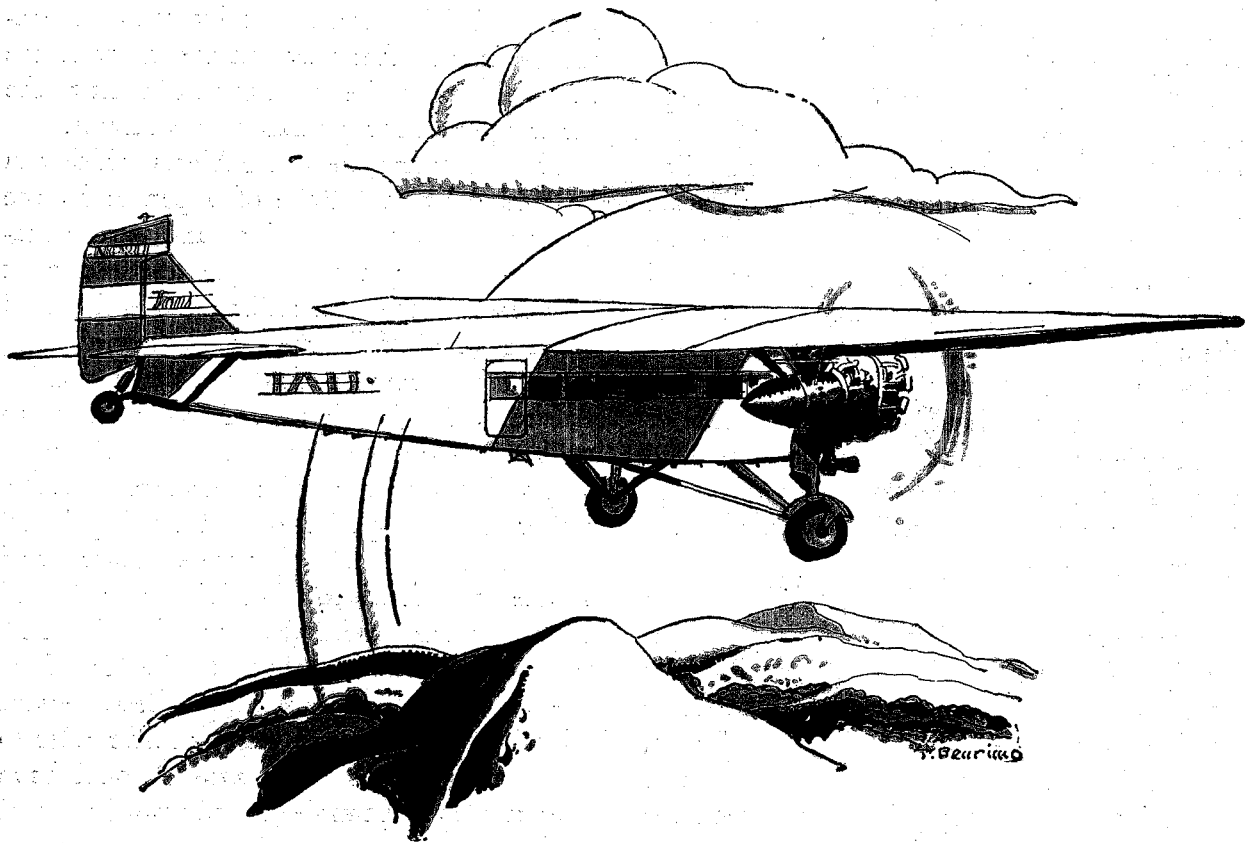


Safety in Air Transport



by **CASEY JONES**

I HAVE flown more than half a million miles. During the past fifteen years I have served as a pilot with the military forces at home and in France, have trained hundreds of students, operated commercial flying in all its branches, tested new planes, flown in races, and ridden on most of the country's air lines. I am familiar with the problems and dangers of flying and am not easily disturbed. In fact I can qualify, as they say in court, as an "expert" air traveler.

Recently I was making a flight from Chicago to Cleveland on a line operated by one of the transport companies. I had heard, at that time, about an article published in the February FORUM ("Death by Air Transport," by Lloyd S. Graham) which was causing comment in the aviation industry. I purchased a copy before boarding the plane and stuck it in my pocket to read en route. There it remained while the pilot revved up each of his three

motors to see that they were functioning properly and, on signal from the flagman, gave her the gun and we were off. After that I became interested in noting the route the pilot would follow, spied an incoming air liner traveling fast and low with a tail wind, and spent some time explaining to a lady seated ahead of me that we were climbing to an altitude of more than 8000 feet to take advantage of a tail wind there instead of bucking the head wind that was blowing near the ground. Consequently we were two miles up over the tip of Lake Michigan when I got out my FORUM and turned to Mr. Graham's article.

The first page was good reading, describing the start of an air journey — in fact, it might have been an account of our own departure from Chicago fifteen minutes earlier. Reading on, however, I found my hair literally standing on end. After a series of unwise decisions, breath-taking escapes, and lugubrious regrets

on the part of the pilots, the plane, finally out of gas, plunges into the clouds, pulls off its wings, and the finale, left to the imagination of the reader, isn't intended to be pleasant. As a picture of what might happen to an air transport operated by men who were deliberately disobeying known regulations covering conduct in bad weather, flown from an airport where there had been no time to get accurate weather reports to another whose radio equipment had got out of order, with a gas reserve lower than any sane company would countenance, those first paragraphs are probably true enough; and as an introduction to a plea for compulsory installation of parachutes on air transports, they are masterly. But they are certainly not a fair or a reasonable presentation of the facts.

The temptation to hand the FORUM article to the lady ahead was great, but I decided that if I did there would probably be, if not an outright death by air transport, at least an inconvenient swoon because of a sensational article written about it. I remembered the fright of a friend who, as the plane in which he was taking his first flight left the ground, opened the detective story with which he hoped to soothe himself and read the first line — "I have one minute to live!" If Mr. Graham's paper affected me, a seasoned air traveler, what would it do to anyone who uses or plans to use the air and who does not know the truth? *Are* air transports unsafe because they are not equipped with parachutes? That is the question which I want to try to answer.

SAFETY, FIRST AND LAST

THE DETERMINATION for safety in the operation of a modern air transport begins the instant pencil is laid to a sheet of paper in the engineering department of an aeronautical manufacturing company, and it is the overwhelming principle down through all the succeeding considerations of structural perfection, motor efficiency, routes, landing fields, lighting, radio, weather reporting, training of personnel, and so on.

No industry has ever voluntarily subjected itself to such rigid governmental supervision as has aviation. The Aeronautics Branch of the Department of Commerce was established in 1926 by Congressional action in order to "regulate and promote" aviation in all its

aspects. During the next five years an exacting set of rules, covering every phase of airplane construction and operation, was worked out between the Department and the industry. Before a ship is built, the plans are subjected to a searching stress-analysis by trained engineers and approved in detail by the Department. During the process of construction every part is given a rigid physical test and must come up to the required specifications. The same degree of engineering skill that has made possible such structures as the Empire State Building and the Holland Tunnel creates and makes practical the modern airplane.

Twelve years ago there was no commercial aviation — no landing fields, no transport equipment, no weather reports or radio, few instruments; nothing but an ambitious group of flyers who were out of jobs and saw financial possibilities in flying, and a few people down in Washington who felt that aviation as an industry must be supported if only for future use in national defense. Simmering in the minds of a certain few was the idea of flying mail. Finally the Post Office Department took the initiative and established the air mail, first between New York and Washington, then between New York and San Francisco, flying only by day. Later, part of the run was lighted and the night mail came into being.

The Post Office Department entered into this venture experimentally, intending to turn it over to private operators if it proved a success. It was successful, and so came the task of finding operators. In 1923-24 capital was showing little interest in commercial aviation — in fact, an exceeding lack of interest. Eventually, however, one of the principal lines attracted backers, not because they expected to make even a normal return on their money but because they felt it was a public-spirited thing to do. Some of the lines were a drug on the market; the Department actually had to go out begging different groups to take contracts. Then, to everybody's surprise, the things started to make money. The volume of air mail had increased far more rapidly than anyone anticipated so that, at three dollars a pound (the rate contracted for in most instances), the operators were sitting pretty. But they didn't want passengers with all the changes and new problems they would entail; they were frank about it. So 1925 passed and

still no passenger lines had been organized.

But the march of progress cannot be stayed. Even while the efficiency of the air mail was being recognized and developed, distance and endurance flights were offering glimpses of still greater opportunities inherent in this latest mode of transportation. People went abroad, made use of Europe's extensive air network, and came home asking embarrassing questions; trans-oceanic flights and their attendant publicity centered national attention on aviation; and last, but not least, the public at that time had lots of money and was in the mood for investing it. Furthermore, the volume of air mail had been increasing steadily, which was very nice for the operator at three dollars a pound but rather expensive for the Post Office Department. It was evident to everybody that the carrying of passengers along with the mail would reduce the expense of both.

Washington finally realized that some support of American aviation was a matter of sound common sense, and that airplane manufacturing, the new infant industry, was in a bad way. The result was the appointment of the Morrow board to investigate the situation, and later the creation of Departments of Air in the Army, the Navy, and the Department of Commerce. To insure the manufacturers a continuity of orders, the Five-Year Program was laid down. As for passenger traffic — well, that looked more feasible now that the Post Office Department, desiring to revise the mail contracts on a more economical and equitable basis, was urging its establishment. Recognizing the trend of affairs, the same groups that had supported aviation through the trying period up to 1926 felt that they must shoulder the responsibility of another pioneering job — the organization of the passenger lines.

It was my good fortune to be one of three men appointed by one of these groups to a technical committee, of which Charles A. Lindbergh was chairman. I was sent abroad. Equipment, personnel, routes, traffic handling, airports — even such a matter as the cause and prevention of air sickness — were exhaustively investigated and studied in the light of European experience and practice, naturally far greater than our own. After a year of such preliminary work and consultation with all sorts of experts, the embryonic passenger line felt that it was at last in a position to

formulate definite policies of operation.

We considered, first, the matter of equipment. Every argument for economical operation pointed to the use of single motors. Ships were available that could carry six or seven people — the maximum load we would get, at least at first — at a price of approximately \$15,000. At that time the records of the air mail showed that the chance of motor failure from mechanical causes was once to every 100,000 miles (the figure is now once to every 500,000), and the possibilities of such failure occurring over terrain too bad to attempt a safe landing were remote. But — we bought multi-motored ships at a cost of \$60,000 apiece; in other words, we paid four times the price to carry less than twice the load, with a proportionately larger operating cost. Why? For increased safety.

It would have been possible to run the line without an elaborate system of weather reports; we had all been flying for years without them. But such a system was set up, with hundreds of trained observers and an expensive teletype installation for quickest possible transmission.

Radio, too, was not absolutely necessary; but we wanted it — for safety — and spent thousands of dollars experimenting and many more thousands for final installations. Millions, literally, were spent to provide the best and safest in airports, landing, and emergency fields.

But we didn't buy parachutes. Too costly, implies Mr. Graham.

WHY NO PARACHUTES?

THE REASON that air transports didn't install parachutes was that no parachute had been sufficiently developed to make its use in a transport practical. It just couldn't be done. I feel I can state here authoritatively that if such parachutes had been available, the first air liners would have been equipped with them, even before the money for some of the other safety devices had been spent.

Now, however, after four years of operating without them, let us see what experience shows in the light of actual knowledge gained from the accidents that have happened. For three and a half years of scheduled air mail, passenger, and express operations, ending in June, 1931, and covering 93,000,000 miles, there

were — according to Department of Commerce figures — 375 accidents of all kinds. Only 49 of these were fatal, resulting in the deaths of 64 passengers and 43 pilots. From January to June, 1930, there was one passenger fatality to every 474,928 miles flown; from July to December, 1930, one to every 543,294 miles; from January to June, 1931, one to every 709,550 miles. Of the 49 fatal accidents, only 21 involved passengers, the other 28 occurring in the carrying of the mail. Thus more than half of the fatal accidents happened to pilots who *were wearing parachutes at the time!*

Of the 21 accidents resulting in passenger fatality, the most searching and honest analysis indicates only one instance where parachutes would undoubtedly have saved lives and one other instance where they *might* have. In the first case a military ship doing stunts around an air liner collided with it at a high altitude; three passengers and two pilots were killed. In the second instance, the Rockne accident, in which six passengers and two pilots were involved, eye-witness testimony shows that difficulty serious enough to warrant abandoning the ship and taking to parachutes was encountered at an altitude too low for their effective use. While it is true that lives have been saved with chutes from an altitude as low as 150 feet, the acknowledged minimum is 500 feet, and even the most enthusiastic supporter would bank on nothing less.

Accidents are expensive in the loss of material and personnel, the falling off of business, and probable damage suits. In view of all this, and in view of the millions already spent, it is preposterous to insinuate as does Mr. Graham that "the transport operators will not admit that they have made a definite agreement among themselves not to go into the expense of parachutes, and to oppose aggressively any legislation which may force them to provide parachutes." The insinuation that the Department of Commerce has conspired with the operators in refusing to require chutes is equally ridiculous. The Department does require parachutes for certain types of flying, and why it should discriminate except for excellent reasons is beyond me.

Let us refer to Mr. Graham's statistics on air accidents in which parachutes were used. He states that the largest number of these crashes,

29.46%, were caused by control failure. But the published figures of the Department of Commerce fail to show a single control failure in the three and a half years of scheduled air line operations! Mr. Graham includes in this 29.46% planes that refused to come out of spins when controls jammed, and while this particular kind of failure is not listed separately by the Department, the total number of accidents in scheduled operations, fatal and non-fatal, attributed to spins with or without motor failure during three and a half years, was only 9 in 375, or 2.4%. And 4 of the 9 occurred in 1928.

Mr. Graham also says that structural failure caused 20.67% of the jumps. The Department's figures for the 375 accidents listed attribute only slightly over 12% to structural failure and further analysis shows that all of these — with the exception of less than $\frac{1}{2}$ of 1%, which resulted from wing, brace, or strut failure — were due to failure of the undercarriage, wheels, tires, or brakes. Of what advantage a parachute would be in these cases is a mystery. For my part, even with the landing gear gone, I would still prefer to stick to the ship rather than take to the chute.

Again I quote Mr. Graham's figures. "Collision . . . always a hazard of the air, caused 66 jumps, or 17.05%." What does the Department of Commerce say about scheduled operations collisions? It says that there was just one Class A collision — that is, a collision in full flight with other aircraft (that which has already been mentioned); and 47 Class B collisions — that is, collisions in full flight with objects other than aircraft, such as trees, poles, mountains, and so on. In other words, in transport flying only one collision occurred where chutes could have been used.

"Fire caused 28 jumps" — thus Mr. Graham. The Department records only 6 transport fires in the air during the three and a half years, none of which resulted in the loss of passengers as far as can be learned.

And so down the list. Assuming that Mr. Graham's figures are correct, and I have no reason to doubt them, why do I take objection to them? For this reason. They are obtained largely from statistics concerning the Caterpillar Club, an organization whose candidates become eligible when they save their lives by using a parachute; these jumps have occurred

in every branch of flying — military, naval, commercial, pleasure, testing, racing, stunting. To apply these figures to transport operations is obviously unjust and misleading.

PARACHUTES IN THE ARMY

TO ARGUE further that because all military air services have made parachutes regulation equipment, the transports should be legislated into doing the same is childish. Military flying, discounting any possibility of being actually shot down, is infinitely more hazardous than straight passenger carrying. At the same time the military flyer, mind and muscle trained to act quickly, has an infinitely better chance of making good use of a parachute in his open ship than any passenger could have in a transport plane. Everything points to the wisdom of obligatory parachutes — for the army.

If precedent is to be held up to our legislators, what about the universal practice of the other air lines of the world? England, France, Germany, Holland, and other European countries operated passenger lines long before we entered the field and have established enviable records for safety. Not one of them has adopted the use of parachutes. Perhaps they also are parties to the alleged conspiracy.

Right here I should like to introduce one or two thoughts disturbing to the complacency of those who want to see parachutes legislated into transport use — prematurely. In the past most of our serious accidents have occurred when the planes were trying to fly with a ceiling lower than 500 feet. Within the past year it has been made unlawful to carry passengers at anything under that altitude, but even so an overambitious or overconfident pilot will, every so often, try to get through. Here, as has happened throughout the whole history of transportation, the human error will creep in to upset the best laid plans and regulations for safety. Now, give a pilot the added confidence that parachutes are tucked away for an emergency and he will probably try it more often.

What about those who have made chute jumps and have been killed, who, had they stuck to the ship, would have been saved?

I personally know of three such cases and there must be many more. One pilot in testing a ship got into a flat spin, attempted to jump, and was knocked unconscious by the wing: he never even got a chance to open the chute. The ship spun to the ground, it is true, but the cockpit remained practically intact and he unquestionably would have got off with very minor injuries.

During the period of three and a half years to which the figures of the Department of Commerce refer, there were sixteen jumps in scheduled operations with one fatality. All were made by persons familiar with flying, young, and in good physical condition, so their chance of using a chute effectively was far greater than that of the average passenger. Furthermore, they were usually alone in open ships and there was no added danger from crowding, panic, or refusal to obey an order. The transport pilot is aware of all this, and is aware too that the responsibility of ordering passengers to jump must rest on him alone. Naturally he would want to delay decision until in his judgment there was no further apparent chance with the ship. On the other hand, that decision must be made in plenty of time if, as Mr. Graham observes, the jumps are to be effected in "comparative leisure." The decision is a delicate one at best. It is easily possible that the wrong guess in ordering the chutes would result in greater disaster than sticking with the ship. I firmly believe from a study of the accidents that have occurred so far that the chutes should have been ordered in only one instance.

It is such considerations that have swayed transport operators, rather than any thought of expense. Parachute manufacturers are steadily improving their product with transport use in mind, and the government is conducting constructive experiments in dropping cabins and entire planes. It is quite possible that a practical emergency method of bringing passengers to the ground safely when all else fails will be developed from these ideas. But parachutes have not been, and are not now, required on air transports because, in the opinion of unprejudiced experts who are in a position to know, the disadvantages still outweigh the advantages.

In an Early Issue — "What's Wrong with Women's Colleges"

Psycho-analyzing the Depression

by **W. BÉRAN WOLFE, M.D.**

NATIONS react to calamity exactly as individuals. Any national disaster is likely to produce national reactions comparable to those generated by the breakdown of a romantic life-formula in an adolescent confronted with his first frustration by reality. The sole difference that might be expected logically is the difference in the degree and variety of the symptoms. The child who must relinquish his belief in Santa Claus makes one specific, individual, and characteristic neurotic response. The nation, being a congeries of such individuals, is more likely to display the entire gamut of neurotic devices simultaneously and in every degree of intensity. Psychological examination of the effects of the depression on the average American demonstrates the truth of this conclusion.

From the point of view of human reactions, the current depression signalizes a breakdown of the most respected clichés of American thought. The average American is imbued with an uncritical belief in the eternal rightness of all things American. No American army has ever been bested in any important encounter. Big Business, with all that the phrase implies, has always been considered as right as God and the Constitution. American independence, self-sufficiency, and isolation have never been questioned, while American speed, sports, technical developments, advertisements, and our scale of living in general are the standards of the world.

The depression has cast grave doubts on the validity of many of these beliefs, and proved others utterly incredible and unreliable. For the first time in history, healthy Americans of native stock are starving in the midst of plenty. The vaunted "splendid isolation" and the time-honored detachment of American diplomacy have become untenable principles.

Big Business, the last of the American idols to expose its clay feet, has been unmasked as a fraud and a delusion. Men who have never questioned the belief that hard work, honesty, and the investment of one's savings in "sound" stocks and bonds would eventually guarantee a comfortable security, are wearily pounding the streets in search of a job. Others who have retained their jobs have developed a panicky slave-morality toward their employers. And to cap the climax, the luxuries and comforts of American living, which have become an almost universal tradition, have completely collapsed. The never-before-questioned rightness of unrestrained competitive individualism has proved itself a fatal boomerang. The great American myth has been exploded.

The effect of this collapse on the average American man and woman has been almost identical with the collapse of a romantic notion in the life plan of a blustering, overly aggressive adolescent. The bewildered child who learns for the first time that Easter bunnies do not lay Easter eggs and that the stork does not bring babies is the psychological model of the behavior of the average American in the current depression. The adolescent who discovers that the God to whom he has been praying all his life is not universally accredited, or the college graduate who discovers in his first month of business that a Bachelor's degree from his Alma Mater is not a *carte blanche* to business success, exhibits the same devastating doubt and discouragement that the psychiatrist finds in the average American of the present day. And perhaps the best parallel is to be found in the case of the romantic youth who falls in love with the girl of his dreams. He marries her amid a fanfare of trumpets and a barrage of rice and old shoes in the most acceptable and traditional fashion, only to find