In the case of two jet aircraft meeting each other, the example becomes even more emphatic. It would be futile and meaningless to seek blame for the tragedy which might follow.

It would be much more meaningful to consider that the real reason we have not had more such accidents is because of the tremendous mathematical improbability of two aircraft happening to occupy the same airspace at a given moment under a very big sky.

In so considering, we would have to conclude that such mathematical improbabilities include a vastly remote but nevertheless very definite probability.

Many jet liners are now being routed through airports which have no radar facilities. On a climb to altitude from such an airport the pilot is, to an appreciable extent, flying blind in that he is unable to see aircraft which may be approaching from various vertical and horizontal angles and which may be on a collision course with him.

It is practically impossible for the pilot to see an aircraft overhead and on a cruise course approaching at a high rate of speed from either the side or from the rear.

As the two aircraft converge, their respective fields of vision change rapidly and while each pilot is able to see where he is going, he is unable to see the converging aircraft until an instant before collision.

In considering this, we must remember that the pilot's cone of vision from the cockpit remains constant in relation to the airplane. The trouble is the airplane is moving constantly and at a very high rate of speed.

This difficulty with vision on a climb-out applies not only to the airliner but it applies to my Bonanza and it applies to most other aircraft. Depending on the types of aircraft involved, the rate of closure under these circumstances can be up to around 1,000 miles per hour.

I, therefore, respectfully submit that routing a jet liner into an airport without radar facilities may bear some resemblance to positioning artillery near an airport and then at periodic times during the day and with closed eyes firing the artillery into the air.

This is not an extreme comparison to make. The projectile from a howitzer will close on its target at the rate of approximately 900 miles per hour. Thus, we are talking in terms of closure rates of two airplanes which compare to the closure rates of a howitzer and its target. We are also talking in terms of projectiles; that is, airplanes, meeting each other which cannot see each other without radar facilities.

Considerations like these should place the danger in proper perspective. It seems to me that radar facilities for the use of such sophisticated machinery is not merely desirable—it is absolutely essential.

3. The absence of more balanced use of radar facilities may be accounted for by the fact that man developed the airplane thinking only in terms of its environment being open space.

Our technicians have brought us to the point where electronic equipment can fly, navigate, and land an airplane with very little assistance from the pilot.

While developing such technology, we have failed to think in terms of the fact that the open-space environment is no longer so open.

We have now been alerted to this and we understand that anticollision devices are being developed.