WHY WASTE TIME ON A BURRO?

By T. S. Terrill, '33

First, a note of warning. If you, gentle reader, are frigid toward matters Aeronautical, pray do not read further. Although the title of this literary miscarriage apparently gives no clue to its content, such is not the case. However, in order that those Techmen who abhor Aviation with all its flag waving and ballyhoo will not feel that they have been tricked into reading an article about it, I place my cards on the table, face up.

Since graduating from Tech in '33, I have carried on a one-man survey of the Aviation Industry, tasting of it here, nibbling on it there—attempting to find a foothold in it where a combination of an engineering education and a year and a half of military flying might find its most fruitful application. At times, I have become thoroughly disgusted with the picture, have attempted to quit it cold, have gone into other fields. But Aviation is like the Lorelei, like a dope. You cuss it, you berate it, you try to run away from it. But no matter where you go, sooner or later a transport is going to fly over. The throb of the engines, the gleam of the sun off the silver wings—it's no use. Back you go to try again.

At Tech I had it figured out that the smart thing to do would be to back up the engineering with practical flying experience. I reasoned that other things being equal, the man who could fly could build a better airplane than he whose experience was limited to paper and books.

With this thought in mind, I applied for an appointment to the Air Corps Flying School, was accepted, and reported for training at Randolph Field, Texas, in July 1934. Followed a year and a half of priceless experience, ranging from Dodo Days when a training plane offered seemingly insurmountable problems to the occasion on which I was forced to fly a five-ton, twin-engined Keystone Bomber solely by instruments when caught by the weather on a cross country hop.

Following the original plan of practicing engineering, using the flying as a background, I went to work in the nation's largest aircraft factory after having been told that the flying experience was of no value to the factory since it was engaged in the building of airplanes, not their flying. (Brilliant observation and very true.)

Six months of working at $19.22 per week (less one day's pay whenever a holiday fell within the working week), finding the employment files glutted with applications from college and technical school graduates from all over the country who were willing to work for a song, riled at the ignorance and the utter indifference of the engineers toward the problems of the pilots who have to fly their monstrosities, and stymied by the factory's refusal to give any credit or recognition to flying experience, I fled the scene, tried another factory, found the same attitude.

At this writing, I have found a place where the combination of engineering education and flight experience is recognized and welcomed. I speak of Pan American Airways, an organization that needs no introduction. Pan American has introduced engineering methods into its flight procedure, has built an enviable record on its pilot-engineer policy. It has put to shame the record of domestic airlines that have failed to recognize the advent of engineering into flight problems.

Here you have a nice paradox. The domestic airlines are using flying equipment which is a maze of machinery within its sleek fuselage and smooth wings, and are thrusting the entire operation of these manifold units on two men—neither of whom is, in general, technically trained. Pan American, using equally complex equipment, breaks the equipment into units, and places from four to five men in its crews, each charged with one function. These men are, in general, engineering or science graduates, and are put through a good deal of training after they join the organization. When I report at Brownsville, I shall start work toward getting an Engine Mechanic's License, an Airplane Mechanic's License, and a Second Class Radio-Telegraph License.

The record tells the story. While the domestics drop planes all over the country, Pan Am has a relatively pure record. Yet the domestics operate with millions of dollars worth of ground aids, over relatively short distances.

Some might question my contention that the majority of domestic airline pilots are not technically trained. American Airlines issued a press release recently stating that 63 percent of its pilots come from the Military Services, 56 percent being from the Army. I know Army pilots. Few are technical graduates. They are anything you want to name—school teachers, doctors, lawyers, economics majors, etc., etc.

Others might question the necessity for technical men at the controls. I remind them of the record. And I invite their inspection of the pilots' compartment of the newer domestic landplanes. As soon as the engineers had cleaned up the external structure of the modern transport, they had to go to gadgets to increase performance. First they hung gadgets on the airplane—wing flaps, retractable landing gear. Then they started on the engines—superchargers, cooling vanes, carburetor heaters, mixture controls, controlled pitch propellers. They added automatic pilots, propeller de-icers, wing de-icers, transmitters, receivers. They added more tanks with more valves, gauges, meters, instruments, dump valves, fire extinguishers and what-nots.

What's the answer?

Since most pilots are not engineers, planes will have to be built to accommodate the available personnel. Ships must be de-gadgetized, and then there must be a break down of duty . . . such as Pan American and the Navy use. That means a pilot with nothing but the controls to worry over, a radio operator for the communications work, a flight me-

chanic—who does not have to be a pilot—but should be an engineer—to operate the mechanical controls—and possibly a copilot-navigator.

Let me appeal to engineers and the men who write specifications to consider the pilot, to consult him on the location of controls, to break down duties. A little less drafting board and a little more flying in dirty weather might convince these scholarly gentlemen of the necessity of simplification in the cockpit . . . if it's possible to get them off the ground.

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MACARTHUR RETIRES FROM DUTIES AS DEAN OF FRESHMEN

After fifteen years of service as Dean of Freshmen, our well loved Dean Macarthur has felt the weight of his advancing years and decided to lessen his troubles. Last June he resigned his position as Dean and this fall will teach classes in Foreign Languages.

Dr. Macarthur had been at Tech only two years, when in 1922, he was made Dean of Freshmen at the same time as Dean Hinrichs became Dean of Upperclassmen. Since then all entering Freshmen have passed through his friendly hands. Who does not remember Freshman history lectures and our surprise at finding that Dean Mac knew all our names after a few weeks of school? And probably many of us recall awakening with a start at hearing our name mentioned in the smooth flow of the lecture. Then there were the consultations in his office about grades and courses and most everything else, even occasionally about discipline. For instance there was the occasion at the end of one year when the old dorm was the Freshman dorm and the residents celebrated with sufficient gusto to arouse the citizens of Pasadena living for blocks around . . .

In addition to his teaching and his work as Dean, another of Dr. Macarthur's real enthusiasms was his interest in Europe and the Travel Prize. From 1926, when Carl Anderson was awarded the prize until it was discontinued in 1933, he conducted a seminar for the benefit of the contestants on what to see and what not to see in Europe.

Dr. Untereiner, who is known to many Caltech graduates, is to succed Dr. Macarthur as Dean of Freshmen.

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SCALE MODEL OF THE 200″ TELESCOPE COMPLETED

In connection with the development of the Palomar observatory and the 200″ telescope, it was felt that the best way to ensure success with the mechanical problems to be surmounted in building the vast instrument, was to construct a scale model on which tests could be made. Accordingly the Astrophysics shop has built such a model to a tenth scale. It is accurate in every mechanical detail, and, as a result of the tests carried out on this model, it has been found necessary to make a few changes in the design of the big telescope. The chief problems studied were the design of the actual telescope tube, and the design of the yoke at the north end of the polar axis. In each case the difficulty lay in ensuring smooth and accurate operation of the instrument, no matter in what direction the observer should happen to be looking.

At the completion of these tests, it was thought that it would be highly desirable to get some further use from the model, and hence a 20″ mirror has been ground, and the whole mounted in the north dome on the Astrophysics building. Of course a few minor changes were necessary to fit the instrument for actual visual observation. Unfortunately no tenth scale observers are on hand, so that the observer's chamber in the upper end of the tube cannot be used, and so an eyepiece has been fitted to the lower end of the tube. A drive similar to that to be used on the big telescope has been incorporated into the setup. This drive is all electric and has some interesting features. It consists essentially of an electric oscillator whose frequency can be adjusted from the telescope control board. The output of the oscillator is fed to the telescope through a synchronous motor. In addition to the manual control there is an automatic adjustment of the frequency to compensate for the effects of refraction when the telescope is operating near the horizon. A further refinement is the automatic operation of the dome. The position of the telescope is communicated through a selsyn connection to a robot instrument which, through a contact system, always keeps the slot in the dome directly in front of the telescope. Still another convenience for the operator is an indicator on the control board giving him directly the right ascension and declination of the telescope at all times.

All these features will be incorporated into the big telescope at Palomar, and, in the meantime, the model on the roof of the Astrophysics building is going to help get the bugs out of these devices and hence help to make the 200″ an immediate success.