

Now, About That Steam Car, Howard—

You've read the Irving version
And the Phelan version . . .
Here's the Daugherty version.

The Irving Version

I owned a Stanley and I had a Doble. The Doble was a great machine, but they both had two big flaws . . . For one thing it took anywhere up to five minutes to get up a head of steam, and the goddam garage could burn down in that time. And also you couldn't get more than 70 or 80 miles to a tankful of water.

And so I went out one day to the California Institute of Technology and had a talk with Doctor Richard Millikan—he was President of the University and a Nobel Prizewinner—and I told him I . . . wanted two real bright boys to come and work for me and to develop the Hughes Steamer . . . He found two young kids, Lewis and Burns, and I told them what I wanted . . . a steamer that would get up a head of steam instantly, or as close as possible, and one that would give me four to five hundred miles without having to refill the boiler. I put them in a garage out near Caddo's headquarters on Romaine Street and I let them go . . .

Lewis and Burns came up with the machine all right. But in the first place, it would cost \$30,000 to \$50,000 to make each automobile . . . I figured I could sell 50 to 100 of them a year, and I still would have had a new car myself whenever I wanted one.

They came up with a flashy-looking five-passenger convertible, a real jazzy-looking machine . . . They told me it would go 400 miles on one tank of water and they had a flash-firing system worked out where they could get up steam in less than half a minute . . . I asked them how they solved the water problem and Burns said to me, "Well, we just made the whole body one big radiator, full of tubes."

I looked at them—these bright, eager Caltech kids—and I said, "You mean the whole body is a radiator—including the doors?" Burns said to me, "That's right, sir. You can go 400 miles on a tank of water." I looked at him again and I said, "So tell me what happens if a car runs into me? Into my door, for example. Won't I get cooked? Boiled? Burned to a crisp?"

Well, little by little they turned red . . . So I walked away and called Noah and said to him, "Turn that goddam thing into scrap metal. Close up the shop. Project's finished."

In the heat of the hassle over who *really* wrote Howard Hughes' autobiography, the prospective publishers of the material (Time-Life and McGraw-Hill) released a few selected passages from the Clifford Irving manuscript and some comparable passages from an earlier unpublished manuscript prepared for a former Hughes aide, Noah Dietrich, by writer James Phelan.

One critical passage concerned Hughes' \$500,000 effort to develop a steam car, with the aid of a couple of Caltech graduates, Bruce Burns, '19, and Howard Lewis, '23—and the Irving version is indeed remarkably similar to the Phelan version. But neither one tells the *real* story. Herewith, our sensational, hitherto highly unpublished *third* version—which is probably much closer to the truth.

Our story comes from spry 86-year-old Robert L. Daugherty, professor emeritus of mechanical engineering. He was chairman of the department when Burns and Lewis were in school, taught them both, was instrumental in recruiting them for the Hughes steam car project, and kept an active interest in the project from its beginning in 1925 until it was dropped.

The Daugherty Version

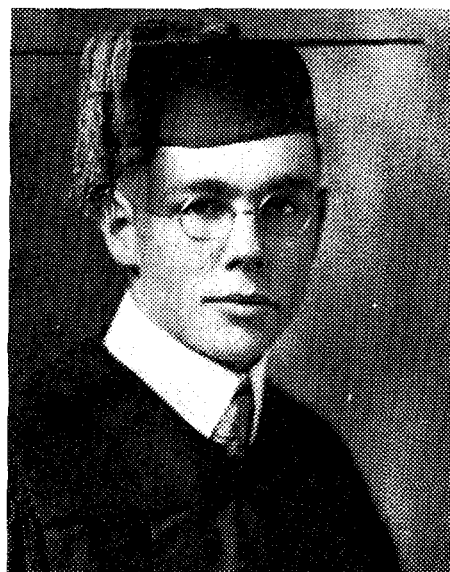
Dr. Millikan had nothing to do with the Hughes steam car affair at all. He didn't know either of those boys. Burns graduated in June of 1919, but he stayed on an extra semester to make up some units. Millikan came to the Institute as chairman of the executive committee in 1920. Lewis graduated in 1923 and had no contact whatsoever with Millikan.

It all started one day in 1925—about 4 p.m.—when I received a call from somebody in the Hughes organization. Not Howard Hughes himself. This man said they were interested in developing the steam automobile. They wanted to know if I knew of a couple of young men who would be interested in such a project. I certainly did. As seniors in mechanical engineering here, Howard and Bruce had had single-track minds on the subject of steam automobiles. Whatever academic course either of them was taking, if it had some possible bearing on the steam engine, they were interested. If it didn't, they didn't want to bother with it.

Bruce had even built a small steam auto—a little fellow that held just one passenger. There was no body on it, no top, or anything. It was just a little flat thing that stood only a couple of feet off the ground. In addition to the boiler he had welded on an acetylene tank to supply the lights and a welding torch that he carried around on the car to put the thing back together when something fell off or it needed repairs around the frame.

Within a half hour of that first call to me I had reached Howard Lewis at Riverside High School where he was teaching physics. Later that day both he and Bruce were in touch with the Hughes company. A few days later the Hughes man called again and told me that they had been looking for two such men for two years.

Hughes set up quarters for Burns and Lewis over in Hollywood. They worked on the steam car project for a year or two as employees of the Hughes Tool Company. I visited their machine shop several times. It was strewn with tools, equipment, and various components of steam engines—boilers, condensers, and so on. They said they were attempting to work on the components separately, improving each before they tried to build a complete engine. Months later Howard



Howard Lewis in 1923



Robert Daugherty in 1927

visited me at Caltech and took me riding in a Stanley Steamer in which they were trying out some of the different boilers they were making. He said they were trying to develop a flash boiler which could get up steam very quickly. Steamers at that time took several minutes to work up enough power. They were trying to reduce this to less than a minute. They were working on the condenser (radiator) system too.

Such development work takes time, since anything of this kind has to have a lot of automatic controls and takes a lot of work to make the various components mesh properly. But it turned out that Burns and Lewis didn't have the time,



Bruce Burns in 1919

because Hughes apparently lost interest in the whole project before they had really made any headway. It is my understanding that he had gotten interested in developing a "thief-proof" lock, and wanted them to work on that.

Both the Irving and Phelan stories talk about a radiator system that had tubes lining the entire car. This is nonsense. The radiator and boiler system were in the front of every version I saw, so there would have been no danger of being scalded to death. I don't think Hughes saw a complete prototype. Rather, he saw a standard Stanley or Doble with a lot of the components added.

Burns and Lewis were switched to work on the thief-proof lock and became the nucleus of the Hughes Development Company. Lewis was manager, with Burns as vice president and Mrs. Burns as secretary. They began to recruit a number of engineers as Hughes' interests diversified and he jumped from project to project. About 25 persons were employed at one time—with about 8 from Caltech. Russell Otis, of the class of 1920, a physicist, was one of the first. He was hired as research director. He died in 1960. Larry Grunder, a mechanical engineer who graduated in 1929, was another employee, as was Clarence Elliott, a graduate of Cornell, who was an instructor in engineering drawing at Caltech. The company was well funded by Hughes, but none of the projects they worked on got too far because he kept losing interest.

According to Grunder, the group worked at various times on such projects as wire recorders, hearing aids, high-speed color cameras, assorted aircraft ventures, and a multicolor process to compete with Technicolor.

When Hughes got interested in the technical side of making movies, it spelled the beginning of the end for the research group. That led him into producing movies, and there was no further need for Burns and Lewis and their group—so in 1931 Hughes abandoned the organization.

In 1930 Hughes produced his first motion picture, *Hell's Angels*. Lewis became general manager of one of Hughes' companies, Multicolor Ltd., but a year later left to set up his own company. In 1941 he became a partner in a consulting engineering firm. He died in 1957. Burns is now in semi-retirement in Yucca Valley, California. Grunder is a consulting engineer living in La Habra. Elliott now lives in Los Angeles. Otis went into practice as a consulting engineer and patent attorney. When he died in 1960, he was vice president of the Oil Shale Corporation of Beverly Hills.

The Phelan Version

Howard preferred his Doble over his Stanley . . . but he was critical of both because they took too much time to get up steam, and they had relatively short non-stop cruising ranges. They consumed water at what Howard considered an inordinate rate, and had to stop about every 60 or 70 miles for a refill.

"I can get better performance than that," he told me, and set out methodically to build the world's best steamer. He and I went to California Institute of Technology and conferred with Dr. Robert Millikan, its president and the 1923 Nobel Prizewinner in physics. Hughes told Dr. Millikan that he wanted to employ two of his brightest engineering graduates, men with creative imagination. Dr. Millikan recommended two young men named Burns and Lewis.

"I want a steamer that will get under way in 20 seconds, starting from a cold stop," he stipulated. "With the present steamer, it takes from two to five minutes to get up steam. If I had a fire, I wouldn't be able to get them out of the garage. Second, I want a steamer that will run from Los Angeles to San Francisco on one filling of water."

He installed the pair in rented quarters on Romaine Street out near the present Sunset Strip . . . I asked Hughes what he thought he could do with such a high-priced hand-made car if it proved feasible . . . "Well," he said defensively, "it's really just a sort of hobby for me. If we put it into production, we couldn't sell more than 25 to 50 cars a year, and we'll probably have to charge \$25,000 or \$30,000 each. I think some of my sportsmen friends would buy them at that price . . ."

Burns and Lewis were waiting for us at their workshop, eager to show off their masterpiece . . . The engineers assured him that it was fast starting and could run at least 400 miles on a single filling of water. "How did you manage that?" Hughes asked. The engineers proudly explained . . . "You mean the entire body contains radiators, including the doors?" Hughes asked . . . "Well tell me, then, if I'm driving along and somebody in another car broadsides me, what happens?" There was an embarrassing silence. "I'd get scalded to death, right?" Hughes said . . . Without ever firing up his \$550,000 super-steamer . . . he ordered it junked. "Dismantle it, get some torches and cut it up into pieces," he said.