

Claude Edmund Burrell

The following details were provided by Cathy Burrell on May 7, 2021

My father worked for A.V. Roe. His name was Claude Edmund Burrell he was a stress engineer he graduated from U of T in Aeronautical Engineering. He was there the day they closed the plant not sure what year he started there the Arrow wasn't his first plane with them

- he was born in 1923, did his undergrad in Aeronautical Engineering and his master's in commerce

- I'm guessing he would have started there in 1947

- his first plane was the CF-100

- didn't find his ID yet but I did find his resume he was at A.V. Roe from 1946-1959 he supervised planning for 1800 man division, analysis and test planning, early computer use

- 1946-57 Numerous analyses by hand methods and some very early use of computers that required the advice of IBM's Scientific staff from New York City

- 1955-57 Senior member of si man team working for Dr. A. Gredzielski, an early author in this field, in development and applications of finite element methods. Developed partitionin technique that cut computer cost by 1/3 to \$5,000. Developed way to prepare databy computer to cut 1 man years work to three days. With one assistan, used about 1,000 computer hours per year.

- 1957-1959 Organized, staffed & led 15 provided project management services to 2,000 man dept. Approved Work orders. Wrote contractual statements of work prepared detailed descriptive plans, schedules & cash flows; and prepared status reports, including analysis of deviation, for 8000 man company. consulted in setting up management services for 40,000 man project

AVRO AIRCRAFT LTD. May '46 - Mar. '59

Feb. '57 - Mar. '59 Organized, staffed and led 15 men providing project management services to 1500-2000 man engineering department.

Jan. '55 - Feb. '57 Used up to 1000 hours of computer time per year in complex structural analyses. Cut engineering labor and computer hours on individual projects by up to approximately one-third.

May '46 - Jan. '55 Analysed a variety of structures. Planned and coordinated structural test programs. Devised early computer application for structural engineering.

In temporary assignment, worked under direction of the Assistant to the V.P. and General Manager to plan all of the company's programs.

B.A.Sc. M. Comm. P. Eng.

Fwb. '57 - Mar. '59

Organized, staffed, and led a group of 15 engineering and business specialists providing contracts and management services to the 1,800 man engineering department and its 8,000 man parent division.

- Won commendation from personnel specialists for smooth recruiting of staff.
- Monitored the department's performance, evaluated results and recommended changes.
- Defined the scope of work portion of contracts for the division.
- Coordinated the total program planning activities for new or revised programs including planning, scheduling, estimating, control methods and technical.
- Coordinated, gave final approval to, and issued work tasks for the division.
- Prepared reports for top management at department, division, corporate and customer levels.

Jan. '55 - Feb. '57

Served as a senior assistant to Dr. A. L. M. Grzedielski, an early leader in applying computers to complex structures problems.

- With one assistant, used 1,000 hours of computer time per year.
- Devised methods to cut machine time. On one job, computer hours were reduced from approximately 800 hours to 240.
- Slashed six man-months to preparation work to two man days by using the computer for a major subtask. This saved one-third of the labour per complete analysis.

CLAUDE E. BURRELL

A. V. ROE CANADA LIMITED
Malton, Ontario, Canada

Salary: \$200/mo to 660/mo

Products: Aircraft

Reason for Leaving: Company essentially folded

May '46 - Jan. '55

Immediate supervisors (in turn): B. Alford, F. P. Mitchell, E. Kosko,
W. Czerwinski, E. W. H. Tompson, C. V. Lindow, B. Shenstone, J. Chamberlain,
J. C. Floyd

Variety of tasks.

- Technical assistant to the Assistant to the V. P. and General Manager in planning, scheduling, estimating and control tasks for the 500 man company.
- Supervised up to five engineers in several structural analysis tasks.
- Airframe test coordinator for approximately 2 1/2 years. This included overall planning and scheduling of tests, detail planning of instrumentation requirements, and monitoring of test items assembly and of all tests.
- Liaison with manufacturing to assist with assembly problems, damaged parts, and repairs.
- Strength analysis and final design sizing of the largest hydroforming tool built in Canada to that time.

Jan. '55 - Feb. '57

Immediate supervisor: Dr. A. L. M. Grzedielski

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Feb. '57 - Mar. '59

Immediate supervisor: J. K. Scott

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Publications:

Structural Analysis of the Haystack Antenna - discussion; J. Struct. Div., ASCE, Feb. '67.
A Preliminary Estimate of Airframe Cost Effectiveness in the 1980's.; AIAA #70-870

Jan. '66 - Present

Serving as V. P. and General Manager for a 10 employee company since on a part time basis.

100	102	Nesque	B70	Vig.	Dark	CR
1. Michel (act. week)	belly band;	Corn Nihil	Met Air	RJD	Fiberglass tail	Pan cups
2. Linda - covered	Helio Chorus	Deep Tanks	57c	Rebar		Royal-Fly cact/pls
3. Under belly patch forming	cell is empty	Habitat	RJD (chair)	Rebar		Seismic P/Hg strong masonry.
4. Marble for house	Opus sculpt	Rondeau	F100	Coupler		Fiberglass Altravac
5. Roubin. large	arch-shingles	Sandwich	Fuel-pump	Swivel		Pa115 method space savings
6. Jack's job	pressure leakage	Engr. Nihil	Essential Budget	ABP		Big Rocks
7. Thel. one Swedman	pressure test	Inspection	Cutty	Coupler		Even. Steel 2
8. Clay bricks	ventures to tank	Smiley	Savior			High 5. ch
9. Creek near center	Don't look	Kennedy Express	Steel Sandwich			
10. Hydroelectric project	Don't ask	Merlin Steel	Composite metal			
11. K.T. Instel	Nose	Brown Roads				Zoom Ball
12. G.H. & Fred Price						Kouder
13. Flat Iron Trail, Canada						Hays Falls

during the depression and war years. Of course Ajax, which had been a munitions factory, had lots of space. I do know we had a vet, who had two years completed when he signed up, join us in third year without incident.

I knew and worked with Dave from 1949 to Avro's crash in 1959. After that I saw him occasionally until he went to Bell. Unfortunately since then it has been Christmas cards. In the Avro days it was illegal for engineers to form unions but with Avro's agreement we had a committee of which for a while I was chair. I believe Dave was active later and that is how he became known to the Ontario Institute of Professional Engineers.

Alex Grzedelski joined Avro where he applied finite-element to the Arrow structure. The idea is that the structure is considered as made up of axially, bending, or shear loaded pieces. The assembly has many paths for the loads to go. One set of paths is chosen to start. Then calculations are done which rebalance load-paths as determined by minimum energy.

The calculations use matrix algebra. This algebra developed in the 1840's first showed up applied to an engineering problem in The Journal of the Philosophical Society in the late 1930's. We got an introduction in our second year - but only because one of our math instructors was working for a PHD in matrices. It only became really useful with the advent of computers. (Remember WWII computers fully occupied three-story cube-shaped buildings.)

But theory says you can lose significant figures in the answers of up to one-third of the number of unknowns. Alex's first real test of whether he'd get answers was a computer run at IBM Scientific NYC. If I remember correctly, Dave worked with Alex and Dick Shearly in setting up that problem. Later a programmer who supported Alex's team, there for a course, was asked if it had been used as it was second in complexity only to some work for the U.S Atomic Energy Agency. Told we'd done several more on other computers, she spent the two weeks teaching how she had programmed those other computers!

By the mid 1950's a typical problem had 300 by 300 matrices and 75 unknowns. By 1970 nonlinear problems and thousands of elements were handled. Today finite-element is a major tool in automobile body design. All of which Dave probably told you!

I hope this rambling told you a little more about Dave.

sympathy

Dear Shawn

Sorry to hear of Dave's death. And thanks for your kindness in informing us and sending us your speech. I intend to send copies to Dick Shearly, Cliff Gundesen, and Harry Rosewarne; all of whom would have worked with Dave.

It apparently is difficult for doctors to know of imminent heart problems without a lot of hightech stuff. In a "Mash" episode one doctor asked another what he'd do if a patient who'd just got a clean bill died just outside. "Easy, turn him around and make it look he was just coming in."

I too was active in scouts, although I never made King's Scout. As all our group's leaders signed up in 1939, I ended up leading the group while in collegiate and in university. That meant acting as scoutmaster, recruiter of people to run the cub pack, and unsuccessful in persuading parents to serve in the group committee. The shortage of males forced the movement to recruit women as leaders, mainly for the 8 to 12 year old cub groups. I was still active with district work when Avro folded. Not being a U.S. citizen as required there, and overwhelmed in the last months in Canada, stopped being active when we went to the U.S..

I started at Toronto in 1942 in Engineering Physics, expecting to start in the Aeronautical option in my third year. (Once in there were only two ways out. 1. Fail your year. 2. Get both your dean and the commanding officer of your reserve unit to recommend to Ottawa; and get Ottawa's OK.)

They made the option a full department in 1944. The head of the department T.R. Loudon was away as director of research for the RCAF. So they got a new grad Ben Etkin to stay as instructor. Ben's career included being the only one giving the re-entry trajectory of ill-fated Appolo 13. (He expected NASA to query several and average!) If he'd been off one way the capsule would have ricocheted back into space. It would have burnt up if he was off the other way. Dave would have known Loudon, Etkin, as well as Alex Grzedelski (Sp?).

When I started at Toronto each faculty's first year students had to wear ties; red for meds, green for engineers, etc. Then each first years task was to tear as many other colour ties off as possible. That practice was stopped when some people wearing black ties in mourning were assaulted. So I don't think hazing was very strong by the time of Ajax. I believe the real reason for Ajax was the University was short of space due to neglect

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The Arrow's cancelation ended hope that the military would have the best during a major war. AVM Curtis told of pleading before a WWII commission for airplanes made in Canada to go to ill-equipped Canadian squadrons. Equipment designed by other countries was controlled by the commission which sent those aircraft to Russia. The AVM said that he then realized that a first class airforce must control its aircraft.

To confirm the message instead of Arrows the airforce first line service got aircraft withdrawn from the U.S. reserve.

While the Arrow was designed Avro produced almost 700 home-designed CF100s and Canadair produced many Sabres with major RCAF design changes. Both aircraft had Canadian designed Orenda engines. Aircraft & engines got large export sales. During this period the feds ran surpluses that ended with those contracts.

P.S. In peacetime it is no problem as countries gladly sell the best to help fund their design-build teams. And even the largest service dislikes diverting some of their best from operations to development. But that's the price to be the best!

C.E. BURRELL, P.Eng

R. R. #4

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9 August 1999

Re: Letters to the Editor

As one who worked on the ARROW and corresponding US aircraft I have different beliefs than C. Moore (Aug./Sept. 1999). At close I managed the airframe's cost & schedule report to the RCAF.

Two times the total cost of airframes, engines, and available electronics was spent by the government developing a beyond the state-of-the-art electronics system. Cancelled. Back to Avro's recommendation. (This also had airframe costs.)

NASA had evaluated the ARROW for the RCAF. It rated the technical work so highly that a quarter of the staff and the manager of NASA's early space program were ex-Avroites. They continued in key spots throughout the space program.

The noise about cost and quality hides the essential. I heard Air Marshall W. Curtis speak of his appeal to a WWII Allied Commission that assigned aircraft made in one country to another's design. The RCAF here was ill equipped and the A/M asked for aircraft from a Canadian factory. They went to Russia. The A/M then said that he realized that a first class air force must control its own aircraft. Obviously the ARROW's purpose. (For more detail see page 62 of Greig Stewart's "Shutting Down The National Dream".)

Yours;

C. E. Burrell P.Eng.