
**At left, the Hon. J. A. D. McCurdy presents the McCurdy Award for 1954, for achievement in the aeronautical technical field in Canada, to TCA's Merlin MacLeod (at right).**

# An Aeronautical Assembly

THE CONTINUED preoccupation of all levels of industry and government with what is widely regarded as a critical shortage of technical personnel, attracted the attention of a substantial portion of the upper crust of Canada's aeronautical engineering population when the Canadian Aeronautical Institute gathered for its second annual general meeting recently.

Held this year in Toronto, May 19 and 20, the meeting was well attended and drew engineers from all the main centres of Canada's aviation industry. During the business sessions, the composition of the 1955-56 council was established and at the annual dinner, R. D. Richmond of Canadair officially succeeded Dr. J. J. Green as president of the CAI. Dr. Green continues as a member of the council in the capacity of past president. Vice-president is Thor Stephenson of the Department of Defence Production, while Charles Luttman carries on as the organization's permanent secretary-treasurer.

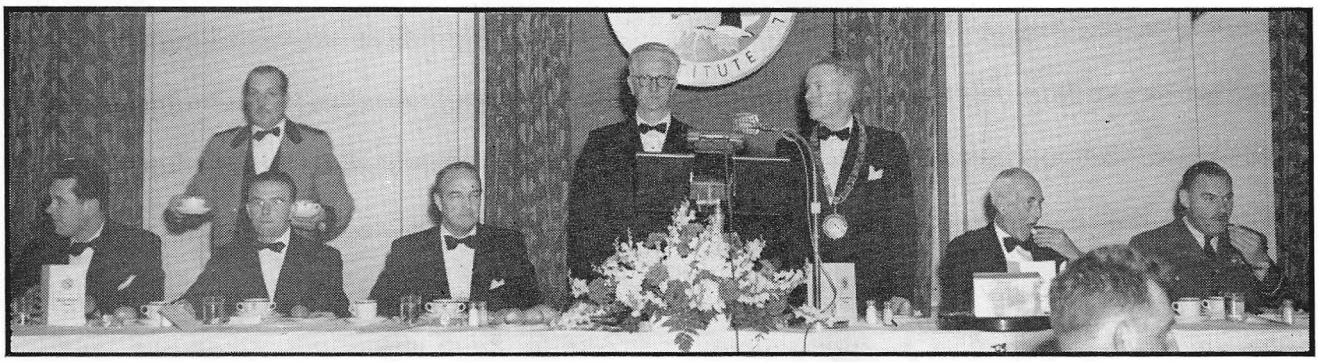
Councillors are J. C. Floyd of Avro Aircraft, W. D. Hunter of DH Canada, C. J. Luby of Canadian Steel Improvement (all from Toronto), E. B. Schaeffer of Canadair (Montreal), T. W. Siers of CPA, J. Bertalino of the DoT (both from Vancouver), D. A. Newey of MacDonald Bros., and R. C. Guest of the DoT (both from Winnipeg).

**Anything Wrong?** The general concern about the shortage of technical personnel in the aviation industry quickly became evident during a panel on aeronautical education. The panel, which was carried on under the chairmanship of Prof. T. R. Loudon of DH Canada, for nearly three hours, set out to answer the question: "Is There Anything Wrong with the Education and Training of Aeronautical Technical Personnel in Canada?" Prepared presentations by Professor Bernard Etkin—giving the university's views—and by E. B. Schaeffer—telling the industry's side—laid the foundation for the building up of a lively discussion by the panel members and the audience.

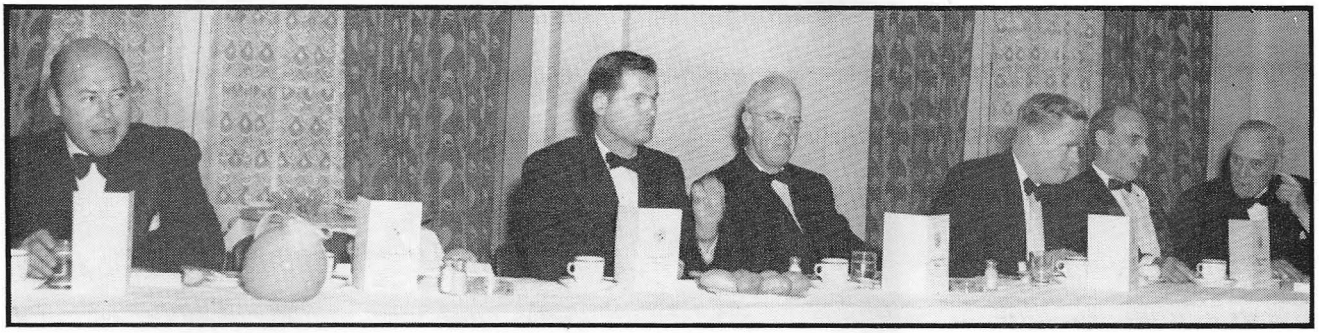
Prof. Etkin, who is Associate Professor of Aeronautics at the University of Toronto, led off with a paper on "The Education and Training of an Aeronautical Engineer," in which he reviewed his university's course in this field. The emphasis on the engineer's training at university should be on the basic principles of science and mathematics, Prof. Etkin thought, with only a quarter of the student's time in a four year course being devoted to practical application. Important goals of the university education were the development of the student's capacity to learn new things on his own, and to think analytically.

"Aeronautical engineering is rapidly becoming a five-year course," Prof. Etkin said. "It is becoming the custom to continue on postgraduate study for an extra year at the Institute of Aerophysics." Part of the responsibility for the continuation of the training of aeronautical engineers lay with the employers, who should get to know the man, and match the right man to the right job. Part of the responsibility for continuing his education also lay with the embryo engineer himself. "It is up to the practising engineers to carry on where we at the university leave off," the professor said.

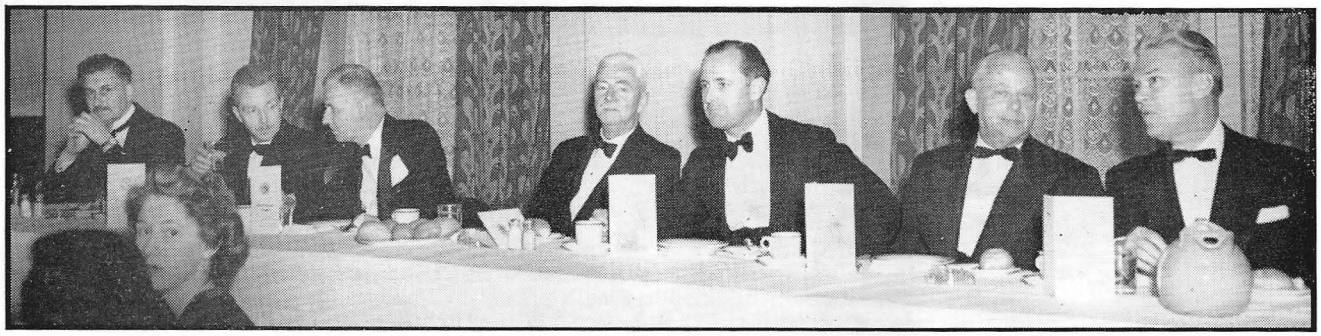
**Industry View:** Mr. Schaeffer, Assistant Chief Engineer of Canadair Limited, continued to develop the theme with his presentation on "An Industry Appraisal of the Education and Training of Technical Personnel." Mr. Schaeffer outlined the growth of Canadair's engineering staff, pointing out that in 1950 the firm had 150 employees in this classification, a figure that had grown to 730 by 1954. Of this



**These photographs show the head table guests at the Annual Dinner of the Canadian Aeronautical Institute. Above, L to R are: R. D. Richmond of Canadair, new president of the CAI; Robert R. Dexter, secretary of the IAS; Gordon McGregor of TCA; Dr. T. P. Wright, vice-president for research at Cornell University, and principal speaker at the dinner; Dr. J. J. Green, past president of the CAI; Hon. J. A. D. McCurdy; A/V/M J. L. Plant.**



**Above are, L to R: Crawford Gordon, Jr., president & general manager of A. V. Roe Canada Ltd.; John W. R. Drummond, vice-president of Canadian Pratt & Whitney Aircraft; D. A. Newey, contracts administrator of Mac-Donald Bros. Aircraft Limited; Thor E. Stephenson, director of the DDP's Aircraft Branch; Cyril Luby, president of Canadian Steel Improvement Limited, and W. D. Hunter, engineering director of de Havilland of Canada.**



**Also at the head table were, L to R: Charles Luttman, secretary of the CAI; J. C. Floyd, engineering vice-president of Avro Aircraft; Dr. D. C. MacPhail, assistant director of the National Aeronautical Establishment; Professor T. R. Loudon of de Havilland Aircraft of Canada; D. N. Kendall, president of Photographic Survey Corp.; Merlin W. MacLeod, of TCA, McCurdy Award winner; E. B. Schaeffer, Canadair asst. chief engineer.**

total, 431 were of the graduate engineer level. It was expected that this section of the engineering group would level off at about 500 eventually. There was a turnover in the Canadair engineering staff of about 5%, indicating that some 25 new engineers were required each year as replacements.

Mr. Schaeffer criticized the new graduate in engineering because he usually wanted to be an analyst, not a designer. "He appears to have a lack of appreciation that an efficient engineering organization requires a community effort of large groups of competent, trained engineers, and wishes to specialize right away."

Industry failed to do a job in that it neglected to follow up university training with planned on-the-job training programs for the recent graduate. Similarly, it did not often offer members of university teaching staffs summer positions in which they could add to their knowledge of actual industrial procedures and requirements, and thus be in a better position to instruct and to advise their students. "Consultations and discussions between the staffs of university and industry are for the most part non-existent, and yet would be an effective means of encouraging co-operation between the two to the ultimate benefit of the student." Mr. Schaeffer concluded by urging more co-operation between university and industry.

**R. H. Guthrie,** Engineering Manager for Canadian P & W, reported that his company did have an on-the-job training program under which the engineering personnel worked in the various departments. He called for the extension of the academic training program to include a sound basic understanding of the English language. Too many engineers were unable to express themselves.

**Professor D. L. Mordell,** Chairman of McGill's Department of Mechanical Engineering, said that it was necess-

ary to accept as a fact that there was a shortage of engineers, and that nobody knew how to fix it. "Let us not think that the aeronautical industry is the only one faced with this difficulty," Prof. Mordell emphasized. He felt that to turn out engineers bearing the label of mechanical, civil, aeronautical, or nuclear, was nonsense. McGill was concerned with turning out people who were *fit* to become mechanical, civil, aeronautical, or nuclear engineers.

**J. P. Francis,** Manpower Div., Economics & Records Branch, Department of Labour, pointed out that only one-third of all engineers in the aircraft industry took degrees in aeronautical engineering; the other two-thirds were of other types. This meant that the aircraft industry had to do some training. Mr. Francis also noted that one in five in aeronautical engineering had taken a Ph.D. or better.

**I. A. Gray,** Director of Maintenance & Engineering for CPA, said his company had an engineering staff of 20, of which 10 were graduate engineers and 10 were technicians. In addition, there were about 100 shop technicians or "M" engineers. He said that these people could make or break an operation and some consideration should be given to their training.

Some of them were high school graduates, Mr. Gray explained, and didn't have enough basic knowledge to understand various systems, with the result that they became "unit jerkers." When something goes wrong, they just jerk the unit because they can't trace the trouble. He further suggested that engineers be given some instruction in bookkeeping so that they could do a cost analysis.

**J. A. Chamberlin,** Chief Technician for Avro Aircraft, said that although many persons accumulate a mass of detailed knowledge, they didn't usually add to their academic knowledge. "Postgraduate courses are so narrow that the man who has spent a year with industry is usually just as far ahead." In Mr. Chamberlin's opinion, what was needed was a very sound grounding in the fundamentals plus one or two specialist postgraduate courses.

During the discussion period, a speaker from the audience described

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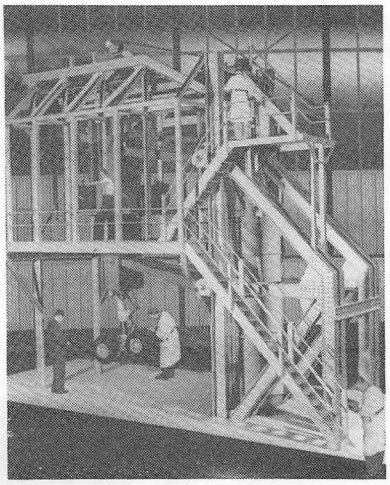
**During his 1953 visit to Canada, George Dowty, chairman & managing director of the Dowty Group, was convinced that there was a growing demand for design and development work in the landing gear and hydraulics business in Canada. The outcome of this conviction was the installation of a Landing Gear Drop Test Rig (top R) in a specially-built extension to the test & development building at Dowty of Canada's south plant at Ajax, Ont. With 2400 sq. ft. of floor space and 40 ft. of height, the new addition (R of bottom picture) is an imposing structure.**

**The drop test rig, which is one of the main tools required in landing gear development, is a special-purpose machine for determining the dynamic performance of aircraft suspensions under landing impacts.**



# Dowty's New Drop Test

**Essentially, it consists of a means of dropping the gear weighted in proportion to its share of the aircraft weight, from a height which will reproduce the descent velocity of the aircraft at the moment of touchdown. Suitable instrumentation measures the resulting loadings, changes in geometry and other performance indices throughout closure and recoil. Major influences on performance such as aircraft attitude, forward speed, wing lift, ground conditions and ambient temperatures can be simulated to the degrees of accuracy necessary.**

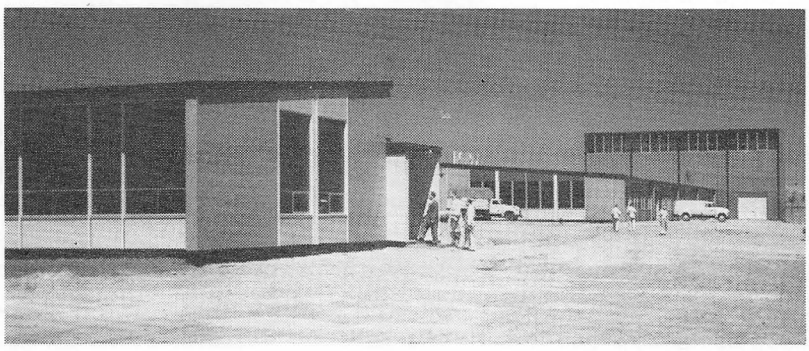
**In planning the rig, Dowty of Canada consulted all the major aircraft companies as well as Government departments and military services, to determine the maximum size of aircraft for which landing gear equipment might be developed in Canada during the next ten years. The decision was finally made to accommodate equipment for aircraft up to 175,000 lbs. gross weight, and to refine the design of the rig to take the lightest possible equipment, since only a certain range of weights can be handled by any one rig. To take care of lower weights, a second smaller rig is also to be installed, as well as static test facilities.**

**The type of rig installed by Dowty of Canada is of the "parallelogram"-configuration, which, while somewhat more expensive to build than other types, is more versatile in operation and more accurate in results. For economic reasons and because of the specialized experience available in England, detailed design and prefabrication of the main structural elements were carried out in that country.**

**The Dowty organization anticipates that for some time the demand in Canada for this type of development work will be limited, and accordingly, though the equipment is intended primarily for the development of Dowty products, it is also available for development and qualification testing of units designed by other commercial firms and by Government organizations.**

**The drop test rig and other development facilities are operated by the firm's engineering department, headed by Chief Project Engineer G. F. W. McCaffrey, formerly associate research officer in the NRC Structures Lab. The development section is supervised by K. A. Trickett, onetime mechanical development engineer in British and Canadian atomic energy establishments, who is assisted by a group of specialists including R. T. Sewell, until recently chief test engineer with British Messier.**

**The development section's work is closely co-ordinated with the design and the applications sections, staffed by equally experienced personnel.**



out, rolling all the way up. Returning to the waterfront from the west, he did a slow roll at about 100 feet, one-eightied somewhere off to the east and came back for a high-speed run, again climbing away vertically doing a series of rolls, first to the left and then reversing to the right, eventually reaching a height of some 10,000 feet. Mr. Lynes performance was concluded with an inverted flypast at about 100 feet.

**Grand Finale:** From the west came a flypast of 16 aircraft, led by four CF-100/4's and including four each of Sabre 5's, T-33's, and Vampires. As these passed before the crowd. three other Sabres appeared in the distance over the lake, flying head-on at the bleachers. When approximately a mile off-shore, the three aircraft pulled up steeply into a sky-high Prince of Wales, this spectacular maneuver signifying the end of the flying display.

Considered on an overall basis, the display was of a very high order of excellence. Getting down to details, it seems to us that an Air Show of the stature of this one could get along very well without Harvards, especially when there are such glaring omissions on the program as the Viscount and the T-34. The Harvard certainly deserves all the honors that can be heaped upon it, but let's face it, the only souls who haven't seen one of these venerable machines do aerobatics by this time are the members of unborn generations.

## TECHNICAL MEET

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Canadian engineer training as "one-legged." Not enough attention was being paid to the technicians or the practical side, he claimed. The European style was to spend time in the shops, and in this way the embryo engineer got an intimate knowledge of fabrication and production tools. He also got an opportunity to get acquainted with labor in a way that was not possible when he gets older.

**Professor G. N. Patterson,** head of the University of Toronto's Department of Aeronautical Engineering, took the floor briefly to say that the answer to the engineer shortage was the dollar sign. "Give us the money and we'll turn them out."

Prof. Loudon, in his summation as chairman of the panel, said that it was evident there must be more co-operation between industry and university at all levels of training.

**Annual Dinner:** Following the conclusion of the first day's sessions, the Institute held its annual dinner in the Concert Hall of Toronto's Royal York Hotel. The principal speaker was Dr. T. P. Wright, Vice-President for Research at Cornell University, who chose as his topic, "Aircraft Design Possibilities of the Future."

At the conclusion of Dr. Wright's address, the stage was set for the presentation by the Hon. J. A. D. McCurdy of the McCurdy Award, which went this year to Merlin W. MacLeod of TCA.


MISS AWA: As winner of the beauty contest staged at the recent annual convention of the Aviation Writers Association, Miss Mary Harrison of Malton, Ont., will receive a free round-trip to Bermuda when BOAC inaugurates Viscount service from New York this coming autumn. Miss Harrison is employed by Orenda Engines Ltd.

It was also announced at the dinner that the CAI had decided to commemorate the late Dr. W. R. Turnbull's early work in the field of aeronautics, particularly on variable pitch propellers, with a "W. Rupert Turnbull Memorial Lecture," to be delivered annually at a meeting of the Institute. The lecture will be given alternately by Canadian and suitable foreign speakers.

### on paper

A NUMBER of outstanding papers on such phases of aeronautics as manufacturing, aerodynamics, and operations were given during the final day of the two-day assembly. These papers, copies of which are available from the CAI in Ottawa, were as follows:

**Manufacturing:** (Chairman, J. W. R. Drummond, Canadian P & W); "The Economic Production of Jet Engines in Canada," by E. K. Brownridge of Orenda Engines; "Economy of Tooling," by R. J. Higman of Canadair; "Titanium Alloys for Aircraft," by H. V. Kinsey of the Department of Mines & Technical Surveys.

**Aerodynamics:** (Chairman, Dr. D. C. MacPhail, National Aeronautical Establishment); "Aerodynamic Studies in the CARDE Aeroballistic Range," by Dr. G. V. Bull of the Canadian Armament Research & Development Establishment; "An Electrical Analogue for the Calculation of the Wave Drag of Slender Bodies," by P. J. Pocock of the NAE; "A Repeating Parachute," by H. T. Stevinson and Dr. P. Mandl of the NAE; "Lift and Lift Distribution of Wings in Combination with Slender Bodies of Revolution," by Dr. H. J. Luckert of Canadair.

**Operations:** (Chairman, D. N. Kendall, Photographic Survey Corporation); "The Human Engineering of Aircraft Instruments & Controls," by R. E. Nethercut of Minneapolis-Honeywell; "The Helicopter, Present and Future," read by J. C. Charleson, managing director of United Helicopters and Canadian Helicopters, on behalf of A. Stringer of Okanagan Helicopters, parent company of the other two firms; "Aerial Survey Operations," by J. Fleming of Spartan Air Services.

## AIR TRAFFIC CONTROL

*(Continued from page 41)*

tion for the safe and efficient completion of flight. Before the commencement of flight, or while enroute, information collected by area control centres through their extensive interphone, radio and teletype communications systems and from other flights in their areas, is made available to pilots.

Information such as current or forecast weather conditions, the serviceability of radio navigation facilities or communication facilities, and information regarding the aerodrome conditions are, in this way, readily available to any pilot planning a flight in Canada.