ysis may be used to "fingerprint" individual polymers, to obtain information on the structure of the polymer from a study of the physical transitions, and to investigate the chemical decomposition of polymers. The application of thermogravimetric analysis is limited to those chemical reactions in which change of weight occurs. Many examples were discussed which showed how thermogravimetric analysis gave information on the temperature stability of polymers, and, by virtue of having a continuous weight recording, showed up intermediates in the decomposition of inorganic compounds. If the nature of the volatile material evolved was known, the formula of the intermediate could be calculated.

The techniques of thermogravimetric and differential thermal analysis have been known for over 50 years but it is only recently that there has been a rapid increase of interest and a widening of its range of application. These recent developments depend upon advances in instrumentation; such advances were reflected in the Apparatus Exhibition, which was arranged in conjunction with the symposium and in which 16 manufacturers were represented.

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Air-Sea Interface

The dynamic interaction between the ocean and atmosphere is a determining factor in designing structures for use at the air-sea interface. Environmental influences acting upon interface structures, and the design of interface structures (in particular, high-speed sailcraft, seagoing aircraft, and the Mohole platform) were discussed at a conference held in Miami, Florida, 22–25 November 1964. Oceanographers, meteorologists, marine and aeronautical engineers, and naval architects attended.

In discussions on the wind field above the air-sea interface, Roll stressed the need for definitive wind measurements. The difficulty of interpreting model experiments was emphasized by Hasselmann, who suggested that wind-wave flumes be designed in such a way that initial conditions can be varied. St. Denis argued that much time and effort would be saved if field experiments were preceded by laboratory experiments with models.

Measurements of Reynolds stress made from Argus Island Tower were described by De Leonibus. The readings of an eddy fluxmeter were compared directly with velocity correlations. The resulting drag coefficient increases slowly with wind speed, although a wide scatter is evident.

The relation between wind stress and the wave spectrum was discussed by Kraus. He emphasized the high wind velocities present immediately above the interface and discussed the drift of monomolecular films at the surface.

Woodcock described some visual observations of Langmuir cells. These cells are held responsible for the weed lines which sometimes develop parallel to the wind. Woodcock's observations show that ballasted bottles also align themselves parallel to the wind. It is likely that the cells extend to the bottom of the mixed layer.

A field study to determine the growth parameters for the initial generation of 17-meter wind waves was described by Snyder. A four-component accelerometer array was towed downwind starting from a windward shore. The resulting growth curves are consistent with Hasselmann's energy equation, but the instability parameter is almost an order of magnitude larger than predicted by Miles.

Review of the history and design of ocean-going catamarans was presented by Choy. The ocean-going catamaran differs from the day-sailing catamaran in its ability to ride a seaway. The bows are built high to prevent tripping, and the underbody profile is somewhat convex. If properly designed the ocean-going catamaran will attain a speed-length ratio of 4 (compared to a ratio of 1.35 for a conventional hull). The day-sailing catamaran is designed to cut through waves rather than ride over them. Hubbard showed several movies of an 18-foot catamaran which competed in the Little America's Cup race. He discussed the inadequacies of tank testing of catamarans and described a tank in which models are towed from the center of effort of their sail plan.

A new type of sailing vessel, the aerohydrofoil, was described by Smith. The aerohydrofoil is theoretically capable of high speeds and small angles of attack. Present models, however, have poor directional stability and require at least four independent controls.

Lill gave a brief description of the Mohole platform, and St. Denis discussed the design of the riser system for this platform. Objections were raised by Spilhaus, who felt that a submerged platform would eliminate many of the problems associated with a surface platform, and by Hasselmann, who, challenging the engineering practice of designing for the catastrophic event, suggested that a statistical approach would be simpler and more to the point.

Turning to the subject of aircraft at the air-sea interface, Griffing reviewed the history of seagoing aircraft and presented sketches of several craft currently in the design stage. He emphasized the need for aircraft capable of taking off and landing routinely at sea. Another aspect of this problem was discussed by Lehnert who described the loss of performance of a gas turbine engine as a result of the ingestion of salt water near the water surface.

The conference closed with a brief exposition by Roll of a shallow-water wave-attenuation study, a summary by Griffing of ground-effects machines (hovercraft), a description by Kraus of a taut-wire spar buoy, and a description by Koczy of a 135-foot power catamaran designed for the Institute of Marine Science.

It was generally agreed that there is still much to be learned about the dynamic interaction between the ocean, atmosphere, and structures at the air-sea interface. The shape of the wind profile above the ocean surface needs to be investigated carefully and extensively. The physical basis for the wind generation of ocean waves is not completely understood. The forces acting on interface structures and the response to these forces need to be investigated in detail. Only then can the design of interface structures become less of an art and more of a science.

The conference was worthwhile in that it brought together for the first time marine scientists, engineers, and architects, and helped to acquaint these groups with one another's problems. Except for several brief discussions of design procedure, however, there was little direct exchange between scientist and engineer. Several important questions concerning the mechanics of interface structures were not discussed: the specification of the forces acting

upon a structure given a knowledge of the wave spectrum, the determination of the transfer function for a given structure, and the effect of nonlinearities.

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Notes

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Forthcoming Events

August

24–28. **Electron Microscope** Soc., 23rd annual, New York, N.Y. (L. Ross, Anatomy Dept., Cornell Univ. Medical College, 1300 York Ave., New York)

25–27. **Gas Dynamics**, 6th biennial conf., Evanston, Ill. (A. B. Cambel, Gas Dynamics Symp., Northwestern Univ., Evanston 60201)

25–27. **Thymus**, Ciba Foundation symp., Melbourne, Australia. (Ciba, 41, Portland Place, London, W.1, England)

25–27. **X-Ray Analysis**, 14th annual conf., Denver, Colo. (Metallurgy Div., Denver Research Inst., Univ. of Denver, Denver 80210)

25–28. Systems Engineering for **Control System Design**, Tokyo, Japan. (H. M. Paynter, Mechanical Engineering Dept., Massachusetts Inst. of Technology, Cambridge 39)

25–28. **Photochemistry**, intern. conf., Tokyo, Japan. (I. Tanada, Laboratory of Physical Chemistry, Tokyo Inst. of Technology, Ookayama, Meguro-ku, Tokyo)

25–28. International **Phycological** Soc., Halifax, N.S., Canada. (E. G. Young, Natl. Research Council of Canada, Halifax)

25–28. **Seaweed**, 5th intern. symp., Halifax, N.S., Canada. (E. G. Young, Natl. Research Council of Canada, Halifax)

26–28. **Helium Superfluidity**, symp., St. Andrews, Scotland. (J. F. Allen, St. Andrews Univ., St. Andrews)

26–28. **Neurovirulence**, symp., Munich, Germany. (Permanent Section of Microbiological Standardization, Intern. Assoc. of Microbiological Societies, Inst. d'Hygiène, Geneva, Switzerland)

26–28. National Council of **Teachers of Mathematics**, Vancouver, B.C., Canada. (J. D. Gates, 1201 16th St., NW, Washington, D.C. 20036)

29–2. American Assoc. of **Clinical Chemists**, 17th natl., Chicago, Ill. (M. E. Hanke, 8424 Rhodes Ave., Chicago)

29–2. **Illuminating Engineering** Soc., New York, N.Y. (A. D. Hinckley, 345 East 47 St., New York 10017)

29–3. AAAS, Laurentian **Hormone** Conf., Mont Tremblant, Quebec, Canada. (J. C. Foss, Laurentian Hormone Conf., 222 Maple Ave., Shrewsbury, Mass.)

29–10. **Forest Hydrology**, intern. symp., Pennsylvania State Univ., University Park. (W. E. Sopper, School of Forestry, Pennsylvania State Univ., University Park)

30–31. **Past and Future of Science**, symp., Krakow, Poland. (B. Suchodolski, Polish Acad. of Sciences, Palace of Culture and Sciences, Warsaw)

30–1. **Antennas and Propagation**, intern. symp., Washington, D.C. (R. J. Adams, Code 5330, U.S. Naval Research Laboratory, Washington 20390)

30–1. Applied **Mechanics**, West Coast conf., Univ. of California, Los Angeles. (P. M. Naghdi, Div. of Applied Mechanics, Univ. of California, Berkeley 94720)

30–1. **Rare Earth Research**, 5th conf., Iowa State Univ., Ames. (S. Legvold, Dept. of Physics, Iowa State Univ., Ames)

30–1. **Structural Dynamics and Aeroelasticity**, conf., Boston, Mass. (F. C. Hung, Space Information Systems Div., North American Aviation, Inc., Downey, Calif.)

30–2. **Fluorine Chemistry**, 3rd intern. symp., Munich, Germany. (F. Weygand, Inst. für Organische Chemie, Technische Hochschule München, Arcisstr. 21, 8 Munich 2)

30–2. **Mathematical** Assoc. of America, 46th summer, Cornell Univ., Ithaca, N.Y. (H. M. Gehman, State University of New York at Buffalo, Buffalo 14214)

30–2. **Regional Science** Assoc., 5th European congr., Krakow, Poland. (H. Wood, Dept. of Regional Science, Univ. of Pennsylvania, Philadelphia 19104)

30–2. American **Sociological** Assoc., Chicago, Ill. (G. M. Sykes, ASA, 1755 Massachusetts Ave., NW, Washington, D.C.)

30–3. **Neuropathology**, 5th intern. congr., Zurich, Switzerland. (O. T. Bailey, 912 S. Wood St., Chicago, Ill. 60612)

30–3. **Nuclear Materials Management**, intern. symp., Vienna, Austria. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington, D.C.)

30–3. Society for Applied **Spectroscopy**, 4th natl., Denver, Colo. (M. W. Skougstad, 215 Hewitt Bldg., Denver 80202)

30–4. **Ionization Phenomena** in Gases, 7th intern. conf., Belgrade, Yugoslavia. (Organizing Committee, Studentski trg. 16/C/IV, P.O.B. 699, Belgrade)

30–4. **Macromolecular Chemistry**, intern. symp., Prague, Czechoslovakia. (O. Wichterle, 1888 Petriny, Prague 6)

30–4. **Organometallic Chemistry**, 2nd intern. symp., Madison, Wis. (R. West, Dept. of Chemistry, Univ. of Wisconsin, Madison)

30–10. **Population**, 2nd world conf., Belgrade, Yugoslavia. (United Nations Population Commission, New York)

30–10. International Inst. of **Refrigeration**, symp., Prague and other cities, Czechoslovakia. (Organizing Committee, Prague 5-Smíchov, Ostrovského 34, Czechoslovakia)

31–11. **Information Theory**, Statistical Decision Functions and Random Processes, 4th conf., Prague, Czechoslovakia. (F. Hrabal, Foreign Relations Dept., Czechoslovak Acad. of Sciences, Narodni tr. 3, Prague 1)

September

1–3. American **Geophysical** Union, 5th western natl. mtg., Dallas, Tex. (AGU, 1145 19th St., NW, Washington, D.C.)

1–3. **Metallurgists**, 4th annual conf., Ottawa, Ont. (Canadian Inst. of Mining and Metallurgy, 906 Drummond Bldg., 117 St. Catherine St., W., Montreal, Que.)

1–3. Biomedical Aspects of **Shock and Vibration Technology**, symp., Denver, Colo. (E. R. Wilson, 5745 S. Huron St., Littleton, Colo. 80120)

1–4. **Aeronautics**, 6th European congr., Munich, Germany. (Wissenschaftliche Gesellschaft für Luft und Raumfahrt, Martinstr. 40–42, 5 Cologne)

1–4. International Assoc. of **Gerontology**, European Clinical section, 4th congr., San Remo, Italy. (A. Zilli, Viale Morgagin 85, Florence, Italy)

1–4. **Immunological Methods**, symp., Chantilly, France. (R. H. Regamey, Intern. Assoc. of Microbiological Societies, Inst. d'Hygiene, 1200 Geneva, Switzerland)

1–4. Society of General **Physiologists**, 20th annual, Marine Biological Laboratory, Woods Hole, Mass. (R. Milkman, Dept. of Zoology, Syracuse Univ., Syracuse, N.Y. 13210)

1–5. **Regional Science** Assoc., 5th European congr., Warsaw, Poland. (H. Wood, Dept. of Regional Science, Univ. of Pennsylvania, Philadelphia 19104)

1–8. **History of Pharmacy**, intern. congr., London, England. (A. L. Short, Pharmaceutical Soc. of Great Britain, 17 Bloomsbury Sq., London W.C.1)

1–9. **Physiological Sciences**, 23rd intern. congr., Tokyo, Japan. (G. Kato, Dept. of Physiology, Keio Univ. School of Medicine, Shinjuku-ku, Tokyo)

1–14. **Cosmical Gas Dynamics**, 5th symp., Nice, France. (M. Roy, Intern. Union of Theoretical and Applied Mechanics, 55, boul. Malesherbes, Paris 8°, France)

1–17. **Algebraic Number Theory**, instructional conf., Brighton, England. (R. R. Laxton, Mathematics Div., Physics Bldg., Univ. of Sussex, Brighton)

2–4. American **Physical** Soc., Honolulu, Hawaii. (K. K. Darrow, The Society, Columbia Univ., New York 10027)

2–5. International Medical Assoc. for the Study of **Living Conditions and Health**, 4th world congr., Karlovy Vary, Czechoslovakia. (Secretariat, Apolinárská 18, Prague 2)

2–9. German **Mineralogical** Soc., 43rd, Hanover, Germany. (F. Buschendorf, Mineralogisches Inst., Technische Hochschule Hanover, Welfengarten 1, 3 Hanover)

3–7. American **Psychological** Assoc., 73rd annual, Chicago, Ill. (The Association, 17th and Rhode Island Ave., NW, Washington, D.C.)

5–7. **Water Pollution**, 3rd intern. conf., Munich, Germany. (B. B. Berger, P.O. Box 1907, Washington, D.C.)

5–8. Federation of French-Speaking Societies of **Gynaecology and Obstetrics**, 21st congr., Lausanne, Switzerland. (P. Bloch, Hopital Cantonal, Lausanne)

5–8. **Mathematics**, 7th Canadian congr., Quebec, Canada. (The Congress, 985 Sherbrook St. W., Montreal, Que.)

5–9. **Allergology**, 6th European congr., Stockholm, Sweden. (S. Kraepelien, Sachs Children's Hospital, Stockholm)

5–9. **Biochemistry of Lipids**, 9th intern. congr., Noordwijk, Netherlands. (J. Boldingh, Unilever Research Laboratorium,