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**CONFERENCE REPORT** ONRL-C-2C-68

FIRST INTERNATIONAL BIODETERIORATION  
SYMPOSIUM, UNIVERSITY OF SOUTHAMPTON,  
9-14 SEPTEMBER 1968

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1 OCTOBER 1968



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FIRST INTERNATIONAL BIODETERIORATION SYMPOSIUM,  
UNIVERSITY OF SOUTHAMPTON, ENGLAND, 9-14 SEPTEMBER 1968

From 9-14 September 1968, the First International Symposium on Biodeterioration met at the Univ. of Southampton, England. Over 200 delegates and guests from over 20 countries attended. A total of 75 papers were scheduled; however, about five were not presented because at the last minute, several delegates from Czechoslovakia and the US cancelled plans to attend. Most of the papers were by scientists from Great Britain, France, the Federal Republic of Germany, the Netherlands and the US. The USSR sent a large delegation of 15 people, headed by Academician Imshenetzki, yet only one paper was presented.

The Symposium was organized by a committee headed by Dr. H.O.W. Eggins of the International Biodeterioration Centre at the Univ. of Aston, Birmingham, in association with the Society of Chemical Industry and the Organization for Economic Cooperation and Development (OECD).

The purpose of the Symposium was to bring together for the first time a group of workers interested in both broad and specialized aspects of biodeterioration. Today the volume of complex manufactured products is higher than it has ever been, and the number that have to conform to narrowly defined standards is increasing. Biodeterioration is among the factors that can cause a product to be sub-standard, and the more highly-processed a product is the more serious are the effects of biodeterioration. Over the past few years there has been a considerable re-awakening of interest in the biodeterioration of materials. In spite of the extreme diversity of the organisms involved -- bacteria, fungi, algae, insects, etc. -- and the vast range of potentially susceptible materials, quite different problems of biodeterioration frequently possess many features in common. One major obstacle in the path of many workers in the field is that they of necessity must restrict their investigations to limited aspects of the subject, and have difficulty familiarizing themselves with techniques and other developments in related aspects. It was felt by the Organizing Committee that an International Symposium covering the field of biodeterioration of materials would serve a most useful function by presenting to biologists and material scientists a broad review of present thinking in the fundamentals of the subject, and more detailed treatments of many of the currently important aspects of biodeterioration.

For the purpose of the Symposium, "biodeterioration" was

defined as the degradation or deterioration of materials as a result of the activities of living organisms. The program encompassed the microbiological deterioration of natural products and manufactured materials in both terrestrial and marine environments, marine fouling, and the various scientific and technological fields related to these studies. Because of restrictions on time and space, and in view of adequate coverage elsewhere, entomological aspects of biodeterioration and the microbiology of processed foodstuffs were not included. The microbiology of foodstuffs before manufacture was, however, included in the program.

The program consisted of the usual introductory speeches, including an opening address by Mr. J. Knox from the Ministry of Technology on the role of government in international cooperative research. It was then divided into four general sessions, consisting of major review papers on topics of fundamental interest and three special sessions, each divided into three concurrent sections dealing with various specialized aspects of biodeterioration.

The basic outline of the Symposium was as follows:

I. Fundamentals of biodeterioration:

philosophy, ecology, taxonomy, timber decay, hydrocarbon microbiology and metallic corrosion, deterioration and protection of materials

II. Control of biodeterioration:

fungicides, protection of timber, biodeterioration test materials, enzymes and physiology of wood-destroying organisms, ecological aspects of biodeterioration

III. Mechanisms of biodeterioration:

microorganisms in corrosion, hydrocarbon degradation, marine fouling, cellulose breakdown by microorganisms, testing for biodeterioration resistance, stored products microbiology

IV. Biocides

The Organizing Committee has made plans to have the proceedings of the Symposium published expeditiously. Arrangements have been made with the Elsevier Publishing Company to publish them by, or soon after, 1 January 1969.

Because the entire proceedings will be available soon, no attempt will be made here to give abstracts of the papers presented. Instead, a mere listing of the papers as they appeared on the program will be given, and readers of this Report can determine from the titles those papers in the published proceedings they want to read. A few papers listed in the program were not given, and as the author of this report was able to attend only one of each of the three consecutive special sessions, it is possible that a paper is listed below which was not, in fact, presented.

Session I: Fundamentals of Biodeterioration

(Chairman: H.J. Bunker, UK)

H.J. Hueck (Netherlands), The biodeterioration of materials  
-- an appraisal

J.M. Shewan (UK), Aspects of taxonomy with respect to  
biodeterioration research

H.O.W. Eggins (UK), Ecology of biodeterioration organisms

Session 2a: Ecological Aspects of Timber Decay

(Chairman: G. Becker, Germany)

C.H. Banks (S. Africa), Durability of South African wood  
and wood-base building materials

J.G. Savory (UK), Microbial attack of timber and allied  
construction materials

B. Henningson (Sweden), Ecology of decay fungi in birch  
and aspen pulpwood

J.F. Levy (UK), Studies on the ecology of fungi in wooden  
fence posts

H. Greaves (Australia), Microbial associations in the  
deterioration of wood under long-term exposure

J.A. Butcher (New Zealand), Ecology of fungi affecting  
untreated and Cu-Cr-As-treated Pinus radiata  
sapwood

E.B. Gareth-Jones (UK), The distribution of marine fungi  
on wood submerged in the sea

Session 2b: Hydrocarbon Microbiology and Metallic Corrosion  
(Chairman: R.W. Traxler, USA)

O.H. Calderon (USA), Metal-organic acid corrosion and some mechanisms associated with these corrosion processes

J.J. Elphick (UK), Evaluation of biocidal fuel additives for intermittent use in aircraft fuel tanks

D.G. Parbery (Australia), The soil as a natural source of Cladosporium resinae

E.C. Hill (UK), Microbial degradation of lubricating oils and emulsions and its engineering significance

H. Rossmore (USA), Control of cutting oil deterioration with gamma radiation

W. Gunkel (Germany), Microbial breakdown of hydrocarbons in the sea

Session 2c: Deterioration and Protection of Materials: I.  
(Chairman: A.H. Walters, UK)

G. Gargani (Italy), Deterioration of works of art following the Florence flood disaster

J. Pochon (France), Biological deterioration of stone

N.J. Butler (UK), Microbiology of cosmetics and pharmaceuticals

R.L. Hughes (UK), Microbial problems in the paper-making and packaging industries

B.E. Purkiss (UK), Microbial problems of industrial water

R. Wasserbauer (Czechoslovakia), The effect of microorganisms on the insulating properties of electroinsulating materials

Session 3: Control of Biodeterioration  
(Chairman: H.J. Hueck, Netherlands)

A.M. Kaplan (USA), Fungicides and the control of biodeterioration - philosophy

G. Becker (Germany), Protection of timber

G. Ayerst (UK), Prevention of biodeterioration by control environment

O. Wälchli (Switzerland), Biodeterioration test methods

Session 4a: Enzymes & Physiology of Wood-Destroying Organisms  
(Chairman: J.G. Savory, UK)

W. Liese (Germany), Some aspects of cellulose degradation in lignified cell walls

N.J. King (UK), Degradation of wood-cell components by extracellular enzymes of Coniophora cerebella

R. Sopko (Czechoslovakia), Influence of extractives on the cellulose and xylinase activities of Schizophyllum commune

M.P. Levi (UK), Effect of carbon-nitrogen ratio on the activities of Polystictus versicolor

D.S. Chahal (India), Growth of selected cellulolytic fungi on wood pulp

S.P. Meyers (USA), Degradation activities of filamentous marine fungi

Session 4b: Ecological Aspects of Biodeterioration  
(Chairman: H.O.W. Eggins, UK)

R.A. Rasmussen (USA), The interaction of interface, diffusio-phoresis and organic components in a tropical atmosphere in establishing a microbial population on biologically inert surfaces

M.H. Bengson (USA), Protection of sensitive components from microorganism contamination

B.J. Zyska (Poland), Deterioration of materials in deep mines

H.O.W. Eggins (UK), Some techniques to investigate the colonisation of cellulosic and wood substrates

J. Upsher (Australia), Fungal spora of the air at Joint Tropical Research Unit, Queensland

J.M. Sharpley (USA), The selective isolation of Sphaerotilus

Session 4C: Deterioration & Protection of Materials: II.  
(Chairman: A.O. Lloyd, UK)

- E.S. Pankhurst (UK), The susceptibility of PVC adhesive tapes and their constituents to microbial attack
- R.T. Ross (USA), Biodeterioration of paints and its prevention
- R. Enninga (Netherlands), Fungicides in latex paints
- L.B. Quesnel (UK), The antimicrobial and rot-proofing properties of cotton textiles comprising the cadmium salts of modified cellulose
- D.D. Gagliardi (USA), Control of biodeterioration in textiles through chemical modification of fiber

Session 5: Mechanisms of Biodeterioration  
(Chairman: W. Liese, Germany)

- W.P. Iverson (USA), The role of microorganisms in corrosion
- R.W. Traxler (USA), Mechanisms of hydrocarbon degradation by microorganisms
- D.R. Houghton (UK), Mechanisms of marine fouling
- K. Selby (UK), Mechanisms of cellulose breakdown by microorganisms

Session 6a: Testing for Biodeterioration Resistance  
(Chairman: R. Zinkernagel, Switzerland)

- R.E. Klausmeier (USA), New approaches to microbial resistance testing in plastics
- C.C. Yeager (USA), Correlation between laboratory and service tests of PVC systems
- J.J. Cavett (UK), A rapid method of determining degradation of plasticised PVC by microorganisms
- A.O. Lloyd (UK), Evaluation of rot resistance of cellulosic textiles
- Y. LeGrand (France), The use of mixed cultures in microbial resistance testing

E.S.L. Jones (UK), Some problems posed by quality screening for biodeterioration

Session 6b: Marine Fouling

(Chairman: D.R. Houghton, UK)

C.R. Pearson (UK), Factors affecting the testing of anti-fouling paints

T. Lovegrove (UK), Prevention of fouling by localised chlorine generation

A.M. Mortlock (UK), Factors controlling metamorphosis in barnacles

E.C. Haderlie (USA), Marine fouling in Monterey Bay, California

M.A. Dolgopolskaya and E.S. Gurevich (USSR), Biological and physiological factors influencing the efficacy of anti-fouling paints

Session 6c: Stored Products Microbiology

(Chairman: D.G. Coursey, UK)

A.M. Adams (Canada), Biocide residues affecting the processing of grapes as wine

J.A. Broadbent (Nigeria), A new look at mouldy cocoa

R.J. Townsend (UK), Biodeterioration of groundnut oil by *Aspergilli*

J.L. Multon (France), A new method of revealing biological deterioration in cereals: automatic measurement of mean germination period

R.H. Tilbury (UK), Mechanisms of biodeterioration of harvested sugar cane

Session 7: Biocides

(Chairman: A.M. Kaplan, USA)

R.J. Lukens (USA), Fungitoxic action of non-metallic organic fungicides

B.A. Richardson (UK), Action mechanisms of some organo-metallic biocides

G.A. Thomas (UK), Biocide development - the manufacturer's problems

J.M.C. Wessels (Netherlands), Fungicidal protection of materials and pH

P.A. Wolf (USA), Effect of pH on the distribution of  $C^{14}$ -2,4,6 trichlorophenol at pH 6 and pH 8

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13. ABSTRACT  From 9-14 September 1968 the First International Biodeterioration met at Southampton University. 75 papers were presented covering such aspects of biodeterioration as timber decay, textile deterioration, marine fouling and fungicide research.		

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