THE MATERIALS BULLETIN

A BIENNIAL PUBLICATION OF THE
INSTITUTE OF MATERIALS, MALAYSIA
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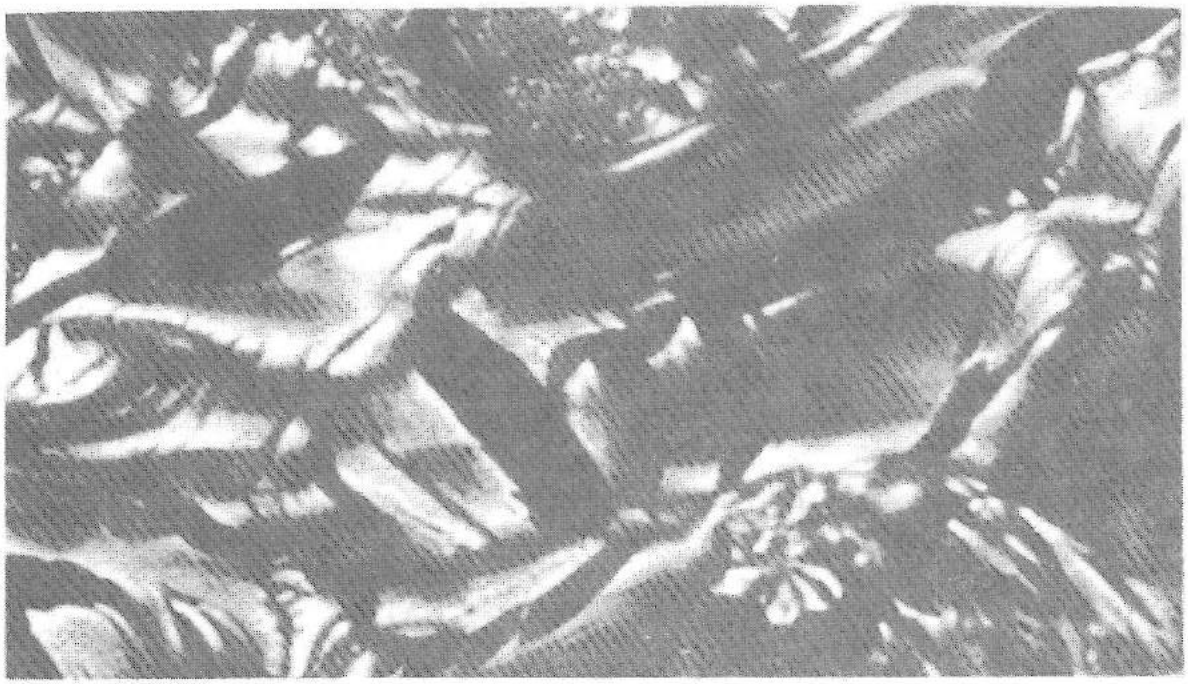

A scanning electron micrograph of ceramics

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From the Editor's Inkwell

After a brief hibernation, in which some of the more cynical members termed as a coma, our society underwent a major surgery and thus was resuscitated. At the AGM in Nov 96', the presidentship went to Dr. Samad Solbai, under whose heslmanship I have been persuaded to provide the "Inkwell" for the Bulletin. Those of you who have stayed with the society through thick and thin, know that we had some very prosperous times in the early years and we are determined that the coming years will be just as prosperous. The Secretariat of the MMS/ IMM is now with MPE, Material Performance Engineering, Shah Alam under the stewardship of the dedicated Mr Ong. We have taken a leaf out of the Government's book by corporatising the management of IMM. However ,unlike such profit making ventures as Telekom and TEN, you can be sure that there is not a long queque to bid for the contract to privatise IMM/ MMS. Now, where do we go from here? Exciting times are afoot, first with the change in name of the society, to reflect a shift to achieving professional status, a move welcomed with great relief by many members and second, with structured and systematic moves to represent the materials profession in the country .We are also committed to represent the diversity of materials we deal with in our profession and last, the representation of materials engineers in the engineering profession. Before I pen off for this issue, I wish to remind everyone that the Inkwell exists because of you, for you and I am not the only one speaking for the profession. This means *all* your comments and contributions are very welcome. Please write, e-mail, fax, call etc. You will find that I am, contrary to my reputation, quite a friendly person!

Che Husna Azhari.
Executive Editor.

Forthcoming events

Some of the forthcoming events are listed here. Members are encouraged to attend and to do the publicity for the Institute. For further information, please contact the IMM Secretariat or the respective Committee Chairpersons.

1. On July 15th 1997, there will be a Corrosion and Welding seminar at the PWTC

2. From 21st-25th July 1997, the Institute will be holding the Welding Inspector Course at De Palma Inn, Shah Alam.

3. From 28th-30th July 1997, the Institute will be holding the Coatings Inspector Course at De Palma Inn, Shah Alam.

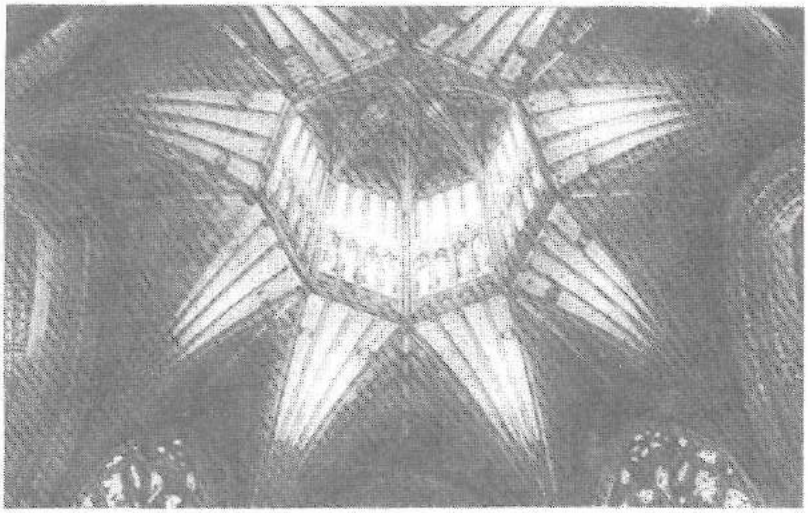
4. On 11th October, the enthusiastic and ebullient Dr. Esah will be organising a one-day seminar entitled Materials for the Non-Materials Engineers at NPC Hotel, Petaling Jaya.

THE MATERIALS WORLD: A TOPICAL WALK- ABOUT

Once upon a time, there were materials. In fact they had always been around. People used them; for shelter, agriculture, to make tools and implements of all sorts, even to fashion clothes. People used them for all sorts of things. Technology came into being because people needed technology to convert materials into products for mankind. A peep into our children's textbook will tell you that history is taught in terms of materials; ie the Stone Age, when stone was the supreme material, followed by the Iron Age, then the Bronze. Next was the Steel Age when steel was the El Supremo of materials, especially engineering materials. Before people like me and you had time to develop steels looking like glass, the world had announced that we are new in the Advanced Materials Age. Professional bodies, griaterics that they are tried to catch up with this new set of definitions.

If one were to look around, really there are only four classes of materials, although some smart alecs have also included semiconductors as the fifth class. However oldies like me, schooled in the traditional materials way stick to the old definition and teach to our pupils the four main classes vi-z metals, ceramics, polymers and composites. As a discipline, materials were disparate, they were taught everywhere but people weren't taking them seriously as a discipline. The Departments of the Materials in the Universities of the world were self conciously trying to jostle for academic space in both the sciences and the engineering disciplines. But, materials has come a long way indeed and it is now a serious and rigorous discipline in its own right. In the issue of the latest Materials World, five departments of materials in the UK varsities obtained the coveted 5 star rating in the varsity assentment, the only discipline to have achieved the status.

People in general take materials for granted. Materials are noticed unfortunately, not when they are functioning well minding their own business, but when they fail. People didn't know Highland Towers were until they failed. Materials get noticed when they break, crack, cleave, dent, combust and creep.



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MEMBERSHIP APPLICATION FORM

(Confidential)

APPLICATION FOR COMPANY MEMBER/ORDINARY MEMBER/FELLOW(FIMM)/MEMBER(MIMM)/ ASSOCIATE MEMBER(AMIMM)/STUDENT MEMBER *

(I) PERSONAL PARTICULARS (2 passport-size photos plus photocopy of I.C./Passport to be submitted)

NAME IN FULL (MR/MS/DR) : _____
(BLOCKS LETTERS)

RESIDENCE/POSTAL ADDRESS: _____
_____

TELEPHONE NO.: HOUSE: _____ DATE OF BIRTH: _____

PLACE OF BIRTH: _____

NATIONALITY: _____ PASSPORT/I.C. NO. _____

(II) NAME OF EMPLOYER/COMPANY

_____

TITLE OR POSITION: _____

ADDRESS: _____
_____

TELEPHONE NO: _____ FAX NO: _____

BASIC QUALIFICATIONS, TECHNOLOGICAL EDUCATION, HONOURS, DECORATIONS AND AWARDS; MEMBERSHIP OF OTHER ENGINEERING AND SCIENTIFIC BODIES.

(One photocopy of document to be submitted)

(III) FOR STUDENT MEMBERSHIP ONLY

COURSE OF STUDY:_____ YEAR OF STUDY:_____

NAME OF UNIVERSITY/COLLEGE:_____

ADDRESS:_____

_____

TELEPHONE NO: _____ FAX NO:_____

The above student is allowed to join the Institute.

Signed:_____

Name:_____

Designation:_____

_____

University/College Chop Date:_____

(IV) COMPANY PARTICULARS (FOR COMPANY MEMBERSHIPS)

COMPANY NAME:_____

ADDRESS:_____

_____

TELEPHONE NO:_____TELEX NO: _____FAX NO:_____

PRINCIPAL REPRESENTATIVE
(MR/MS/DR) _____ POSITION:_____

ALTERNATE REPRESENTATIVE
(MR/MS/DR) _____ POSITION:_____

NOTE: 2 passport-size photos of each representative to be submitted with name written on back of photo.

(V) FOR CORPORATE MEMBERSHIPS OF FELLOW (FIMM), MEMBER(MIMM) & ASSOCIATE MEMBER (AMIMM) ONLY

The following information shall be provided and verified by the Proposer. One copy of all supporting documents (Degrees, etc) to be submitted and certified by the proposer.

TECHNICAL EDUCATION AND ACADEMIC QUALIFICATIONS:

Educational Establishment	Course	Year	Verified

TRAINING EXPERIENCE:

Establishment	Position	Year	Verified

INDICATE INDUSTRY INVOLVED OR INTERESTED IN :-

METALLURGY	( )	CORROSION PROTECTION	( )
MATERIALS FAILURE	( )	COMPOSITE MATERIALS	( )
MATERIALS DESIGN	( )	CONCRETE TECHNOLOGY	( )
MATERIALS RESEARCH	( )	WOOD TECHNOLOGY	( )
POLYMER TECHNOLOGY	( )	EDUCATIONAL INSTITUTION	( )
CERAMICS TECHNOLOGY	( )	OTHERS (SPECIFY) _____	( )
WELDING	( )		

I/We hereby accept responsibility for the accuracy of the particulars contained in this application form.

Date: _____ Signature: _____
(and Company Stamp)

Proposer :_____ Seconder:_____
Name: _____ Name:_____
Membership Grade & No: _____ Membership Grade & No: _____

*Delete whichever not applicable.
NB: If proposer and seconder cannot be sourced, mail this form to the Secretariat for assistance.

SCHEDULE OF FEES

	Entrance Fee	Processing Fee	Transfer Fee	Annual Subscription
Company Member	RM50.00	-	-	RM200.00
Ordinary Member	RM20.00	-	-	RM20.00
Fellow(F.I.M.M.)	-	RM300.00	RM10.00	RM70.00
Member(M.I.M.M.)	-	RM150.00	RM10.00	RM50.00
Associate Member (A.M.I.M.M.)	-	RM150.00	RM10.00	RM30.00
Student Member	RM10.00	-	-	RM5.00

NB: ALL PAYMENTS TO BE MADE OUT BY CROSSED CHEQUE, BANK DRAFT, OR MONEY ORDER TO **"INSTITUTE OF MATERIALS, MALAYSIA"**. ALL APPLICATIONS MUST BE ACCOMPANIED BY THE APPROPRIATE PAYMENTS.

IMM Membership Grades

Company Member
Any company that is involved or has interest in Materials Science and Engineering will be qualified to join as a company member. All employees of a Company Member are entitled to attend Institute functions at membership rate, however, only the Principal Representative or the Alternate Representative shall have voting rights.

Ordinary Member
Any person above the age of 21 years engaged in activities related to research, development and applications in Materials Science and Engineering shall qualify for Ordinary Membership. Only Ordinary Members who meet the necessary minimum requirements may apply for transfer to corporate membership grades of Fellow, Member and Associate Member and may use the abbreviated titles upon transfer.

Honorary Fellow (Hon. F.I.M.M.)
The Council shall have the power to elect Honorary Fellows who shall be persons of eminence in science or industry. The election shall be based on a majority vote within the Council. Honorary Fellows shall enjoy such privileges as may from time to time be determined by the Council.

Fellow (F.I.M.M.)
A person at least 35 years of age with approved academic qualifications, training and 8 years relevant responsible experience who has made significant contributions to the science and practice of profession of Materials Science and Engineering or has given distinguished service to industry or education.

Member (M.I.M.M.)
A person at least 25 years of age, with approved academic qualifications and training, having at least 3 years responsible experience in Materials Science and Engineering.
OR
A person at least 40 years of age, with at least 15 years of experience with practical responsibility, as demonstrated by thesis and interview.

Associate Member (A.M.I.M.M.)
A person at least 25 years of age, who possesses an interest in Materials Science and Engineering but will not yet have acquired the necessary experience or obtained the qualifications governing entry to Member grade. An Associate Member, on obtaining the necessary qualifications, may apply for transfer to Member grade.

Student Member
A student member shall be a person not under 17 years of age who at the time of application satisfies the Council that he has received a good general education and is studying subjects related to Materials Science and Engineering. A student member shall transfer to the grade of Ordinary Member after attaining the age of 21 years provided he or she is suitably qualified and as soon as he or she is earning a full-time salary. A Student shall not become a member of the IMM without the prior approval of the Vice-Chancellor of the university or relevant authority concerned.

Certificate of Membership
Every member shall receive a membership certificate.

Every application for membership shall be proposed and seconded by two existing ordinary members and shall be forwarded to the Honorary Secretary who shall, at the first convenient opportunity, submit it to the Council for approval. The Council may at its discretion reject any application without assigning any reason thereof.

Each company on admission shall be entitled to nominate one representative to exercise all rights of membership. Only representatives of Company membership and Ordinary members shall have the right to vote and to hold office in IMM

I am sure many of us educated in the U.K remember the Open Varsity programme "Strong Solids or why we don't fall through the floor" by Kelly. Much of the discipline now encompasses the science of why things do not get pass through a solid concrete floor, or if they do so, what must have happen to the floor in the first place. A great deal of the materials under study are often engineering materials studied under stressed conditions and they are indeed varied. These materials are not just traditional engineering materials such as steel and concrete but include the composites (the polymer matrix composites, the metal matrix composites and the ceramic based composites) engineering ceramics, wood, polymers and engineering elastomers. The term engineering materials is an intriguing me; the difference being not in the generic structure but in the application; the term engineering materials apply to materials under long service load at high temperatures, usually above 180° C. The term advanced materials is not very far from that of "engineering materials used under severe conditions, high temperatures, high pressures, high loads etc. Lately, another class of materials made their debut on the materials scene, the so-called **advanced materials.** A current definition of the term offered is thus..... *a class of materials used under severe conditions without showing deterioration in properties*... Heading the list are again the engineering materials, a host of newly fabricated materials such as the metallocene polymers and composites and exotic materials found in nature but yet unharnessed for (or domesticated!) mankind. One such class, the biomaterials are discussed in the next feature article in this issue. The afore mentioned exotic materials are things such as spider silk and abalone shells.

An engineering composite which has been around for a long time ,but has not merited due attention is wood. Our part of the world, particularly had spectacular technology based on this material. Buildings, dwellings, maritime structures, boats, ocean-going ships,forts, weapons and agricultural implements were fashioned out of this material.Wood still maintains a strong presence today, particularly in construction, though not in structural applications. It is the odd dwelling belonging to some back-to-nature architect which is constructed out of wood today. Real enthusiasts do not construct their dwellings out of timber due to the exorbitant cost, but the lay public thinks that wood is an inferior choice. We aim to redress this situation by having a feature in the coming issue discussing wood as an important engineering material

As an undergraduate I learnt the truth about science and technology from a professor.. in his own words *educated at Cambridge and finished at MIT*..that the endeavours in technology are to make money and war. I learnt later that indeed this has always been true,but not that it was only for these purposes. I entertained hopes perhaps, technology contributed to money making and war mongering, but not for the sole purpose. Indeed it has come to pass that the professor was right and I am wrong... I learnt that much of the current development in high impact strength ceramics was due to the Gulf War. High impact strength ceramics were developed as shields for tanks that roll in the desert and was even tested as an impenetrable fortress for General Swazchkoff (I hope it is the right

spelling), the fortress turning out to be a Mercedes Benz.

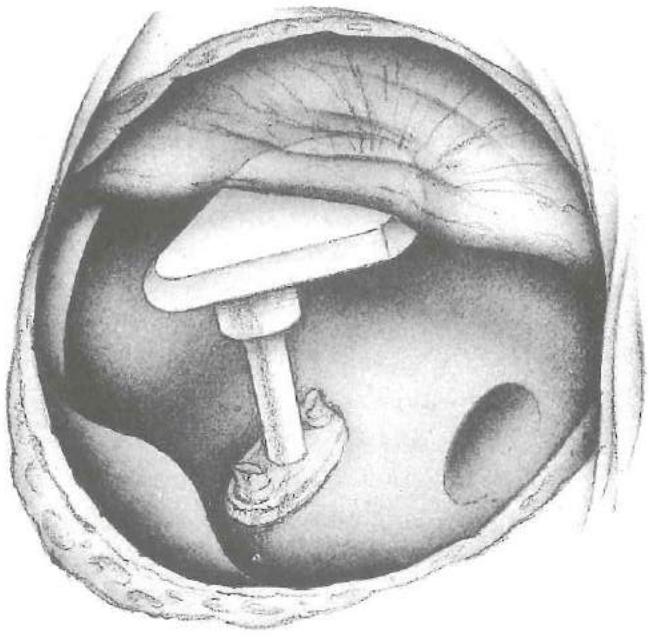
I also learnt that the aquisition of technology is not only strategic, but a political issue. I had applied to conduct research in a certain advanced material and I approached the company to buy the material. Apparently the material, used in firefighting, high impact applications, (including bullet proofing) may only be obtained under delicate negotiations. Delicate negotiations meaning not merely between Company X and Dr. Che Husna.

The study of materials is a fascinating one,not merely because we use it, but because they are the benchmarks of man's endeavours at making the world a better place to live in.For us, in the profession and making money out it, it can become a passion.I hope that my love and enthusiasm for the field has spilled over and infected you as as well.In this short article, it is not possible to do justice to the whole gamut of materials available, suffice to introduce readers to the bouyant and everchanging field of materials.

MATERIALS FORAY: BIOMATERIALS

One of the more recent advances in advanced materials have been in the field of biomaterials. What is a biomaterial ? Definitions are still being debated but a current definition would be... a class of materials used in bio-environment which are bio-compatible or bio-friendly. These class of materials, need not be themselves biological in origin, for examples materials such as biocements, or metals such as titanium and cobalts used in prostheses are not biological in origin, but are termed as biomaterials, due to their usage.Some examples are bio-ceramics, biopolyesters, gelatinised starch products.

A biomaterial when incorporated into living bodies/tissues in medical applications are usually a synthetic or natural polymeric or chemical material whose surface is in direct with biological components. Biomaterials can also refer to materials that are environment friendly. These materials are typically biodegradable. Biodgradation can only occur within the biosphere and micro-organisms and enzymes play a central role in the biodgradation process . Two examples of biomaterials will be discussed in this issue: the bioceramics and bio glass.



Bio ceramics are ceramics with biological applications. When the body' bone muscle and other tissues fail to function,repair or replacement using bioceramics may be made. One such example is Alumina Hydroxyl Apatite used in artificial teeth, bones and joints. Some of the sues of artificial bones are long bones, joints, jawbone replacements, plates and screws for securing broken bones, tendons and ligaments and heart valve replacement.

The main ceramics that have been investigated for biological use are divided into two categories, the bio-inert and the bio-active ceramics. Bio-inert materials produce no changes in the living body and they include stable compounds like C, Al_2O_3, Si_3N_4, TiO_2, as well as CaO-Al_2O_3. Bioactive materials cause decomposition, absorption, recation and precipitation as they contain both CaO and P_2O_5.

Bioglass is a product of the research on the inorganic substances that can form structures which adapt to the living body by means of positive matching of this instability to the growth processes of tissues.

When compared to the precious metals and ceramics, glass is slightly unstable, as it tends to dissolve with prolonged immersion in water, acid or alkali.It is a common knowledge, that in commercial glass, constituents such as alkali ions, which easily dissolves in water, flow out and a silica gel layer is left on the surface. Some typical examples are the Zirconium oxides with Yttrium and Magnesium as well as the Calcium Oxides and the Silicon Nitrides. They characteristically contain phosphoric acid and calcium and thier oxide meshes with large amounts of Na and Ca, giving an explanation as to why they can easily be inserted into the living body. When they are in the body, reaction occurs with the body fluids and the Na ions in the surface part of the glass flows out. A silica gel which centres around an -Si-OH structure forms on the surface of the glass. Eventually, collagen fibres begin to grow from the living tissues and a combines tissue is then formed.In this way, a bond layer is formed between the living tissue and the surface of the glass, becoming a strong inorganic cement between the bone and the artificial tissues that has been implanted.

The next issue will discuss biopolyesters and commercial silk as well as the processing technologies of the biomaterials.

IMM NEWS

News Round Up

The news round-up is probably best started by reporting on the Annual General Meeting held last year, Saturday 19th October 1996 at the Crystal Crown Hotel .It was important to the present Council Members particularly, because that marked their present tenureship. After the AGM, the line up of the Office Bearers are as follows:

President:Dr.Samad Solbai
Deputy President: Dr. Rahim Mohd Nor
Hon Sec: Ir. Ong Chong Hup
Hon Treasurer: Ir. Mohd. Suradi Yasin
Council Members:
Assoc. Prof Dr.Che Husna Azhari
Assoc. Prof Dr. Ramli Omar
Ir. Raziff Embi
Mr.Kang Kim Ang

Assoc Prof Dr. Mohd. Deraman
Ir.Abdul Rahim Mohd Noh
Pn Wan Zaharah Wan Mohamad
Assoc Prof Dr. Teh Ser Kok

Co Opted Council Members
Dr.Esah Hamzah
Pn Jasmin Baba
Pn Maimunah Ismail
Mr. Lorganaden S. Varathan
Dr. Ahmad Shakri Mat Seman
En. Mohamad Ali bin Sofi
Immediate Past President: Ybhg Dato Dr. Hj Mohd. Mansor Salleh

A management commitee was set up to speed up the process of managing activities for the Society. Some of the activities planned are mentioned in the forthcoming events section. The year has also seen another AGM, which was conducted on the 26th of April at Sime Darby Tyre Technology Centre, which, incidentally, is the professional abode of our current president.

Change of name:More than a facelift?

This would be the question on most members' lips when they hear of the suggestion to change the name of our society, The Malaysian Materials Science and Technology Society, to that of the Institut Bahan Malaysia, or the English equivalent, the Institute of Materials Malaysia. Perhaps this would be the best time for the Council Members to explain why the name is more than a facelift. The proposed change in name is to reflect a whole new approach towards recognising the materials profession and many of those who graduated in and practising the profession due recognition as professionals, particularly the engineering professsion. Besides boosting practising professionals in the field the change of name would also shape the future of future graduates in materials science as well as materials engineers. Our new name now has the approval from the Registrar of Societies. The next, and indeed logical step to take would be to start discussions with BEM (Board of Engineers), on the incorporation of IMM into a conglomerate of the engineering profession.In the final analysis, it is not true that, the adage, a rose by any other name would smell as sweet, it has been proven by the marketing people that names do make roses *appear* to smell sweeter.

Professional Developments in the MMS

One of the persuasive reasons for the setting up of learned societies and professional bodies is to provide a structured framework for professional development. Professional development is one of the main criteria used in the awarding of professional status in many learned societies.In the IMM, we have started by awarding corporate status to members such as associate and affliate memberships, corporate membership and fellows. However, professional development means more than just the awarding of degrees of corporate membership, as in professional bodies overseas, it has to mean the continuing education, training and competency one accumulates in a *structured and recognised* fashion. which then contributes to the overall points in the awarding to practise one's profession.
I would like to suggest a special committee to look into matters to professional development to be set up by the IMM. The Institute can assist younger members in the training and accumulation of experience.