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EDITORIAL

The present state of mathematics in Pakistan is appallingly pathetic. It is universally accepted that mathematics plays a pivotal role in the development of science, engineering and technology, which in turn, supply it with new challenges. Therefore, a debilitation in mathematics causes insurmountable impediments in the way of growth of science and technology.

There are plenty of cogent reasons for this deplorable plight of mathematics but the single most excruciating cause, which stands out, is the role of its self-styled egocentric exponents who cannot even be justifiably branded as mathematicians. A very agonizing aspect of this dismaying scenario is that all these so-called mathematicians, who are blocking its advancement, have been enjoying the unqualified patronage of HEC. Thus the funds doled out to these institutions in which the mathematically unqualified persons are at the helm of affairs, is not only a sheer wastage of national resources but also counterproductive.

To salvage mathematics from its complete ruination, it is imperative that the champions of mathematics who thrive only on their propaganda hyperbole, be immediately replaced by appropriate experts in mathematics. It is definitely in consonance with the dictates of justice and fair play to demand that cronyism be assigned nil credit while making crucial appoints like the heads of scientific institutions. It goes without saying that the decisions based on justice and due recognition of merit never fail to succeed and hence can cement the foundation of a nation.

IMPACT FACTOR AND HOW IT RELATES TO QUALITY OF JOURNALS
Vitali Milman

At the touch of a computer key, statistical information is so readily available nowadays that many of us may be tempted to overestimate its value. I have been looking into the question of the validity of information gleaned from the Journals Impact Index (see definition below) and have noted that, for the mathematical community at least, this index gives, in some cases, a misleading impression of the relative standing of journals. This data is often used by department heads in faculty assessments, and people have begun to check Impact Factors (IF) of journals before submitting papers. So, editors of mathematical journals have no choice but to try somehow to improve the IF ranking of their journals, although they are aware that it has little to do with the real quality of the journal. Unfortunately, most actions to increase the IF have an anti-scientific form, and we mathematicians should work to create a different index, more suitable for research in mathematics.

Below I would like to describe why the Impact Factor, as it is calculated today, is not suitable for mathematical journals and would like to open a discussion of how to change the present method of IF calculation to reflect the realities of mathematics research. First, let me explain how the impact index is computed: The IF of a journal for year Y (say, for Y: = 2003 is the ratio C/N, where C is the number of citations during year Y (i.e., 2003 in our example) of papers published in a particular journal in years Y- 1 and Y-2 (i.e., 2002 and 2001). N is the number of published papers during these two years (Y – 1 and Y – 2) in this journal.

This may, perhaps, be a very appropriate approach for, say, medical sciences or biology, where the influence of a publication is decided in the first year or so after publication and, after three or four years many results are already irrelevant. However, what does this mean for mathematics?

Let P be a paper, published in the year Y – 2, which influences the work of a group of researchers. Even if they work very quickly, it can take a few months for them to produce results and write them down. Then new papers, with references to P are submitted. It takes at least a year, and more often a year and a half or two, for these papers to be accepted and published. However, it is now too late for the references in these papers to be included in the IF of year Y. The situation is even worse with papers published in the year Y – 1.

You may then ask, how do mathematical journals show any positive index? The answer is that mathematics papers are very often distributed and widely known before publication. What can editors do to influence this? Very simply, not to publish the best papers too quickly! (Please don’t take this suggestion too seriously, but are you sure it doesn’t enter their heads?) Also, the actual number of papers published each year is used for IF computations, and not the number of pages. This means that a paper of a hundred pages, with many parts, which may be of interest to people in different fields, has a much

better chance of raising the impact index of the journal than a short (and possibly brilliant) paper of, say, five pages long.

Journal	No. Arts.	Citations	Math. IF
J.AMS	34	470	13.824
Annals of Math.	68	630	9.265
Acta Math.	19	164	8.667
GAFA	34	266	7.834
Invent.	85	646	7.600
Duke	94	570	6.009
J.Funct.Anal.	141	666	4.723
Adv.Math	66	274	4.660
Trans. AMS	216	724	3.352
Isr. J.Math.	108	280	2.593

There are many more very "wrong" ideas which may come to mind when we think about our impact index. However, I have learned recently of one consequence of the current structure of the Index which is actually having a positive influence. Many Journals have begun to make all accepted papers available online. This increases the exposure time before year Y, the "critical" time! This is a very crucial one-year period.

In light of this, I would like to discuss a different approach for computing the IF value for mathematical journals. The idea is simple. We know that a few more than just two years are necessary to estimate, appreciate, and understand real mathematical progress, real achievement. So why not calculate data from a few more years back?

I checked a few examples, ten journals which came to mind as being highly thought of, but of different levels. The examples include GAFA, of which I am the managing editor. The table above was calculated for articles published in the year 1999; the number of articles published in that year is shown in column "No. Arts". The "Citations" column shows the number of references, up to October 2004, to articles published in each journal in 1999. The Mathematical Impact Factor (Math. IF) is a ratio of number of citations to number of articles. I believe these examples reflect well our understanding of the status of journals. A surprising result can be seen for the Journal of the AMS; there is a large gap between JAMS' Math. Impact Factor and that of the other journals.

I believe this could be connected to the fact that some areas in mathematics have a much higher citation index, e.g., theoretical computer science or related discrete mathematics papers, firstly because of different styles of references acceptable in those fields, but also because many more mathematicians now work in these fields. JAMS publishes papers in these areas, whereas, Acta, for example, does not; nor do most of the other journals in our sample list (although I may be mistaken here).

Many more ideas come to mind for how one may compute a meaningful index reflecting the relative value of different journals. Also, clearly, journals which publish around

fifteen papers a year (like Acta Math.) or publish around fifty papers (or over 100), should be judged differently. However, as I have already said, I am just try to correct the existing structure with the hope that our mathematical community may influence the Thomson Company, which regularly publishes the Impact Factor, to change the system for mathematics and create (and use) an Impact Factor suitable for mathematics.

The preceding analysis and comments were prepared in November 2004. Recently one very important change has occurred. In September 2005 MathSciNet of the AMS has created its own Citation Database, where we see a citation index for mathematics journals which takes into account the last five years' publications. (See "MathSciNetMatters", Notices, January 2006.) It immediately introduces some adjustments to the order found in Thomson's citation index, and the relative picture is much closer to the table above.

However, I would further suggest that the AMS include the accumulated impact factor and not only a local one. What I mean is the following: on a specific day, say 31 December (of each year) consider all citations to articles published in a particular journal in, say, 1999 (or a period of a number of years, say, between 1999 and 2002). This accumulated number of citations is then divided by the number of articles published during that time (say, during 1999, or during 1999, 2000, 2001 and 2002), the resulting ratio being the cumulative impact factor. *(This article has appeared in Notices AMS, Volume 53, Number 3, March 2006.)*

INTERVIEW OF PROFESSOR MIKIO KANO

Profile:
Professor Mikio Kano received B.E. degree in 1971 from Tokyo Institute of Technology, and M.D. and degree of Doctor of Science in 1975 and 1984 from Osaka University. He was a Lecturer and an Associated Professor at Akashi National College of Technology in 1975-1983 and 1983-1993, respectively. Since 1993, he has been a Professor in the Department of Computer and Information Science, Ibaraki University. His research interests are discrete mathematics and its applications, in particular, graph theory, discrete geometry and their applications. He has been a Managing Editor of "Graphs and Combinatorics" since 2000.
(Insert picture here)

Interview:
Question Keeping in view the quality of research papers presented by Pakistani mathematicians in IPMC-2005, how would you rank Pakistani researchers internationally?

Answer I mainly study discrete mathematics, but there are a few talks on this topic. So it is difficult for me to answer this question. However, I think that there are some nice talks on algebra (finite groups). Thus I feel that Pakistani mathematicians are higher than some southern Asian countries.

Question How far can an International Conference on Mathematics help to mobilize the local community in doing creative work in mathematics?

Answer I don't understand precisely the question. But let me try to give an answer. I attend international conferences to give talks, to get new results, and to find new problems. Also usually I am very impressed by some people and some talks, and I am encouraged by them very much. Then I can study more or continue research after going back to Japan or my university.

Question Higher Education Commission of Pakistan has adopted a multidimensional approach to promote research activity in our faculty. One of the aspects of their policy is to hire foreign faculty to work in Pakistani universities on a short-term basis. Do you feel that this approach for developing research is more helpful than sending students to other countries for their advanced studies?

Answer I think that to send some students to other countries is best. However, it is difficult to send many students. For example, I did not get such chance, and so I studied only in Japan. If you hire a foreign faculty for a short term, then fairly many students would have a chance to get something from him. I know that the Center of Discrete Mathematics of Nankai University (Tianjin, China) became one of best research groups in the world by hiring some foreign staffs (see the following website). Also let me say that the two very important staffs of the center study in US and Germany.

Question What are the dominant reasons for making mathematics a compulsory component of the school syllabi universally?

Answer Mathematics is very important in Engineering and Sciences. Also mathematics has many beautiful results and a lot of variety of methods (proof techniques). So by studying mathematics, people become smart, and get some ability to find new ideas, to do something good for others.

Question It is a matter of common experience that mathematics is not a very popular subject in the academic institutions of third world countries. Could you suggest some remedial measures to curb this tendency?

Answer I have no good suggestions. The following is perhaps good in some sense. If you have one special area (research group) in mathematics which is the highest standard in the world, then some people will visit the group by using their own research budget (of course, if you support some of local expenses, it encourage such people a lot). Then it will be good for some students and other people.

MATHEMATICIANS WHO WON THE NOBEL PRIZE

Qaiser Mushtaq

With the awarding of the 2005 Nobel Prize in Economics to Robert J. Aumann have come remarks that he and John Nash were the only mathematicians to have received

Nobel prizes, said Donald Saari, University of California, Irvine. But there have been others.

Bob Aumann was in the mathematics department at Hebrew University for many years. He is PhD in algebraic topology. Later he became interested in game theory. He got his Nobel Prize in his work in game theory.

There are several other examples of mathematicians receiving the Nobel Prize. John Pople of Northwestern University was honored with the chemistry Nobel in 1998. He received his Ph.D. in partial differential equations from Cambridge. His research involved finding different approximations for the Nervier-Stokes equation and relating it to chemistry.

Herbert Hauptman is another example. He received the 1985 Nobel Prize in chemistry. Hauptman earned his Ph.D. from Maryland for his work on an n-dimensional Euclidean algorithm.

Kenneth Arrow received the 1972 Nobel Prize in Economics. He earned his M.A. in mathematics from Columbia, and much of his Ph.D. training was in statistics and economics.

Another name is Gerard Debreu, who received the 1983 Nobel award in Economics. He received his doctorate in mathematics in France. Debreu was strongly influenced by the Bourbaki School in France.

Leonid Kantorovich received the 1975 Nobel award in Economics. He was chairman of the mathematics group in Novosibirsk in Siberia and later of a mathematics group in Moscow. He is well known for his work on conformal mappings, variational methods, and functional analysis.

John Bardeen was Chairman of the Mathematics Department at Urbana. Although he did not earn his Ph. D. in mathematics but much of his work for which he received Nobel Prize involved mathematics.

Abdus Salam was MSc in mathematics from University of the Punjab, Lahore. He received his Nobel award for his “unification theory” in physics. But his theoretical work in physics depended heavily upon group theory.

Bertrand Russell though got his Nobel Prize in literature but he is well known for his work on mathematical logic. His joint celebrated work on mathematical logic with N.L.Whitehead and the famous Russell’s paradox are just a few examples of his being a profound mathematician.

Donald Saar in his article entitled How many mathematicians have won the Nobel Prize? said that if one wanted to count Nobel winners who used a significant amount of fairly sophisticated mathematics in their research, one probably would have to include close to

half of all Economics winners and several more from Chemistry and Physics (including Einstein).

FOREIGN MATHEMATICIANS AT QUAID-I-AZAM UNIVERSITY

Qaiser Mushtaq

The history of mathematics is an enticing but neglected field in Pakistan. One reason for this lies in the nature of intellectual history in Pakistan. Telling the story of mathematics is not a conceptually distinct undertaking from describing the theory of mathematics, though the two presentations appear in different guises.

The Mathematics Department of Quaid-i-Azam University, born in 1967, being the only federal and post-graduate department, has played a leading role in establishing traditions in mathematical research in Pakistan. Its contribution in producing a locally educated mathematical workforce in Pakistan has yielded a mathematical culture, which has its own peculiar dimensions and effects. It is worthwhile to look at the history of the Mathematics Department of Quaid-i-Azam University analytically and see its influence on research in mathematics.

The Commission on National Education came to the conclusion in 1958-59 that the post graduate studies in scientific and technological disciplines required a great deal of reorganization and development. In 1962 the case of post-graduate studies in the basic sciences was taken up again and it was proposed that one center of Advanced Studies and Research should be developed in each university of Pakistan. The international component of the financial support was supposed to have been received from UNESCO, USAID, and Ford Foundation. But at the time UNESCO ran into political and financial crises and therefore the plan received a setback. Later in the same year, the Commission on National Education decided on an alternative plan. It decided to establish a post-graduate university at the national capital.

Dr.M.Raziuddin Siddiqi, who was then the chief of Higher Education in the Reforms Implementation Unit and Vice Chancellor of the University, managed to win support from Dr Herman B.Wells, President of Indiana University, Dr.McGeorge Bundy, President of the Ford Foundation, Dr.David Bell, Vice-President Ford Foundation and Dr.George Gant, Representative of the Ford Foundation. On 5th December 1964, Dr.M.Raziuddin Siddiqi assumed charge of the Vice-Chancellor's office of the University of Islamabad in the office of the Science and Technology Research Division, of which he was the in-charge, in a building near the Ministry of Education at Chaklala. When Dr Siddiqi relinquished charge of the Division, a spacious building in Satellite Town near the Holy Family Hospital in Rawalpindi was rented for the university office early in 1966, and very soon after that when teaching and research work started on a regular basis, a number of other buildings were hired in the neighbourhood. The foundation-laying ceremony of the permanent campus took place in June 1967 and the University of Islamabad Act was approved by the National Assembly on 2nd July 1967.

In the first Five-Year Plan (1965-70), it was decided that the university would be purely unitary type, without any affiliated colleges – it would consist only of its own teaching institutes. Each institute would be of inter-disciplinary character containing all the major branches of the subject. As a result, there would be no separate departments of Pure Mathematics, Applied Mathematics, and Statistics as in the other universities of the South Asian subcontinent, but only one Institute for Mathematical Sciences encompassing all the branches of mathematics shall be developed. The M.Phil. and M.Sc. classes in Mathematics and Theoretical Physics started in September 1966. Eminent visiting professors from abroad were appointed to give regular course of lectures in these subjects.

The Ford Foundation first started to help the Government of Pakistan in founding Quaid-i-Azam University by funding foreign faculty members, followed later by UNESCO. The list of foreign faculty members funded by the Ford Foundation include Marvin Marcus (linear algebra, spring 1970); W. D. Rannie (fluid mechanics); F. A. Graybill (statistics, spring 1971); S. Eilneberg (mathematics, spring 1971). The latter wrote his book on "Automata, machines and languages" while he was at Quaid-i-Azam University. The foreign faculty funded by UNESCO includes R. Wiegandt (algebra, August 1970 - July 1972); H. Klitzing (computer science, arrived in spring 1972); A. V. Arhangelskii (topology, arrived late spring 1972 and spent about 3 years).

TEACHERS' TRAINING WORKSHOP ON MATHEMATICS AT THE FEDERAL GOVERNMENT COLLEGE FOR WOMEN, G-10/4, ISLAMABAD

Federal Government College for Women, G-10/4, Islamabad, being a premier institution has always taken the lead in arranging refresher and orientation courses in various subjects. These courses help in the future development and in enhancing the professional competency of the faculty members. It helps teachers to keep themselves abreast with the latest advancements in their fields of specialties.

Professor Ghazala Khalid organized a 12-day workshop/teachers' training course on mathematics in the Federal Government College for Women, G-10/4, Islamabad, from 17th April to 29th April 2006 under the auspices of the Federal Directorate of Education, Islamabad.

Eminent mathematicians and academicians were invited as resource persons who enlightened the participants with their valuable ideas and views. The participants of the workshop were from various colleges of Islamabad.

The topics covered the multifarious nature ranging from the role of Muslims in the advancement of mathematics to the Probability Theory, Mechanics, Calculus, Importance of Numbers, Numerical Analysis, Linear Algebra, Metric Spaces, Role of Mathematics in the Development of Computers, Mathematics and its Applications, and How to Teach Mathematics. It also addressed current issues like character building, student - teacher relationship, teaching methodology, and communication skills.

The workshop/teachers' training course on mathematics provided a useful forum to the teachers to refresh their minds and share their experiences with each other. The lecturers delivered by Professor Dr.Qaiser Mushtaq, Professor Dr. S.M. Yusuf, Professor Dr. Q.K.Ghori, Professor Dr. M.Sarwar Kamran, Dr.M.Shabir, Dr. M.Aslam, and Mr.Waseem Siddiqi gave the participants an insight into the teaching methodology helping to build strong mathematical concepts in the minds of their students in a better way.

PROF LEWINS EMPHASIZES IMPORTANCE OF MATHEMATICS IN PAKISTAN

A country which wants to excel in science, technology and engineering cannot afford to underestimate the role of mathematics in these areas, said Professor Dr. J. Lewins, an eminent scientist of U.K. and a professor of Nuclear Engineering at Cambridge University. Professor Lewins, is presently on a visit to Air University, Islamabad

Professor Lewins was the speaker at the 9th national seminar on mathematics organized by the Pakistan Mathematical Society (PakMS) at the National Language Authority.

Professor Lewins said that the mundane role of mathematics is to facilitate the physicists in the numerical calculation of certain constants or the integration of certain differential equations. However, he continued, mathematics does play a more sovereign role.

The laws of nature can be interpreted in mathematics, he elaborated. All laws are deduced from experiments but to enunciate them, mathematics is needed. For example, he said, the association of motion with mathematics shows the richness and significance of mathematics. He explained the dependence of physical phenomenon on mathematical theories and tools.

Air Marshal (Retd) Qazi Javed Ahmed, Vice Chancellor of Air University, was the Chief Guest at the 9th National Seminar. He appreciated the efforts of the Society in its efforts to improve the dismal state of mathematics in Pakistan. He said that he was concerned about scarcity of adequately qualified mathematicians in Pakistan.

Professor Dr Qaiser Mushtaq introduced the Society and its activities. He said that PakMS provided a forum to mathematicians for independent opinions. He said that it was a genuine and the only mathematical think tank, which was contributing valuable suggestions and opinions on government policies vis-à-vis mathematics.

The current president of PakMS, Prof Dr B.A.Saleemi, said that four such national seminars were held annually. These seminars, he said, form part of the activities, which the PakMS organizes to help improve the state of mathematics education in the country. He thanked the Pakistan Science Foundation for its support in organizing these activities.

CONFERENCES/SEMINARS

7th International Pure Mathematics Conference 2006
5 – 7 August 2006
Islamabad, Pakistan

Description:
The 7th International Pure Mathematical Conference 2006 (7th IPMC 2006) is the 7th international conference in the series of Pure Mathematics Conferences that take place in Islamabad every year in August. It is a thematic conference on Algebra, Geometry, Analysis held under the auspices of the Pakistan Mathematical Society. The entire conference is organized under one roof at a four-star hotel in the modern, peaceful and beautiful federal capital of Pakistan located at the footsteps of the scenic Margalla Hills. There will be free housing for local participants. Several recreational trips will be organized in and around Islamabad introducing the unique local and multi-ethnic culture.

Information and registration:
Please fill in the on-line registration form at www.pmc.org.pk and find more information therein. The conference is convened by Professor Dr Qaiser Mushtaq in collaboration with the Mathematics Division, Institute of Basic Research (Florida, USA), Higher Education Commission, Pakistan Science Foundation, Pakistan Telecommunication Ltd, and Quaid-i-Azam University, Islamabad.

International Conference and Instructional Workshop on Discrete Groups
17 July to 4 August 2006
The Morningside Center of Mathematics, Beijing
People's Republic of China

Description
Locally symmetric spaces and discrete subgroups of Lie groups have played a fundamental role in many branches of modern mathematics. Various aspects of these important objects are often studied by different groups of people using different methods. It would be beneficial and fruitful to bring together experts in all these areas to exchange their results and techniques, to develop possible collaborations, and to show the power and beauty of locally symmetric spaces and discrete subgroups of Lie groups.

Information and registration:
For more information the following persons can be contacted: Xiaoning Li (for hotel and arrival information); e-mail: xnli@mail.math.ac.cn; Chen Fang (for titles and abstracts of talks); e-mail: qjpam@henu.edu.cn.

10th National Seminar on Mathematics of the PakMS
24th May 2006
Auditorium, National Language Authority, H-8, Islamabad
Description:

The 10th National Seminar on Mathematics of the Pakistan Mathematical Society will take place on 24th May 2006 at 5.15 p.m. at the Auditorium, National Language Authority, H-8, near Shifa International Hospital, Islamabad. Professor Dr. Qaiser Mushtaq, Quaid-i-Azam University, Islamabad, will speak on the Impact Factor. Miss Anisa Zeb Tahirkheli, the State Minister of Education, Government of Pakistan, has consented to be the Chief Guest.

Information and registration:
For registration and information contact Dr M.Ashiq at ashiqjaved@yahoo.co.uk .