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CORRESPONDENCE

Assessment of research impact of engineering institutions

The dictum 'Garbage in: Garbage Out' applies not only to computers but also generally to any creative process. Based on outdated, incomplete and questionable 'scientometric' data of Nagpaul, Prathap (*Curr. Sci.*, 1995, 68, 869) has drawn some misleading conclusions on assessment of research of major institutions in engineering during 1987-89. Prathap is obviously aware of the fact that 'too little information is a dangerous thing', but all the same he has gone ahead with his analytical exercise.

Let us keep in mind that each engineering institute has its unique features and contributions. We must compare apples with apples and not with oranges. Indian Institute of Science, Bangalore, is primarily a research institute. It has the largest faculty and the largest budget compared to the IITs, and its faculty has little or no teaching. Benaras Hindu University is the largest university in the country with all possible disciplines, including some engineering disciplines. Even the IITs, which have a lot in common (e.g. heavy emphasis on innovative teaching), have many distinctive features. The faculty strength varies from about 300 in IIT Kanpur to over 500 in IIT Delhi. The number of departments/centres varies from about 15 (Kanpur) to 27 (Kharagpur). Even among IITs, a comparison has to be made between comparable departments/centres. And this comparison should include publications, Ph D/M Tech theses, consultancy projects, sponsored projects, industrial interaction, entrepreneurial activities, etc. Besides conventional departments/centres, each IIT has some unique departments/centres. For example, Kharagpur has Departments of Mining Engineering, Naval Architecture and Ocean Engineering, Architecture and Planning, and Centres such as Cryogenic Engineering, Rubber Technology, Post-

Table 1. Current Contents on Disc (CCOD)

	PCES 1994	ETD 1994	SBS 1994	Total
IITB	107	88	4	199
IITD	105	164	3	272
IITKAN	100	106	0	206
IITKGP	138	154	2	294
IITM	108	206	2	316
Total	558	718	11	1287

	PCES May 1995	ETD 1995	SBS 1995	Total
IITB	62	67	3	132
IITD	70	103	3	176
IITKAN	71	82	0	153
IITKGP	61	111	2	174
IITM	66	99	2	167
Total	330	462	10	802

Physical, Chemical & Earth Sciences (PCES)	840 Journals
Engineering Technology & Applied Science (ETD)	825 Journals
Social & Behavioural Sciences (SBS)	1360 Journals

Table 2. INSPEC

	1992	1993	1994	Total
IITB	131	142	139	412
IITD	240	152	247	639
IITKAN	131	125	130	386
IITKGP	214	104	205	523
IITM	227	241	223	691
Total	943	764	944	2651

INSPEC is the leading English-language abstracting and indexing service providing abstracts and source information from the world's published literature on all aspects of physics, electronic and computing in approximately 4200 journals, 1000 conferences, books, reports and dissertations, adding over 250,000 records each year.

Table 3. IEEE/IEE publications on DISC (2410 journals)

	1990-May 1995
IITB	82
IITD	153
IITKAN	38
IITKGP	121
IITM	72
Total	466

Harvest Technology, Aquaculture, Biotechnology, Reliability Engineering, etc. Each departments/centre in any IIT has its own R&D culture, which does not necessarily mean publications. Thus, some departments/centres have very few publications but have a very high reputation of their R&D contributions to the industry and other public/private institutions.

Tables 1-3 list comparative statistics of recent publications from the five IITs which are readily available in our Electronic Library and have been obtained from different sources: (1) Current Contents on Disc (CCOD), (2) INSPEC and (3) IEEE/IEE. Each source refers to a group of disciplines, as explained in the captions. Of these groups, the IEEE/IEE publication data are more meaningful for comparison since all IITs have comparable (though not same size) departments in the field. The data in these tables clearly contradict the conclusions of Nagpaul and

Prathap and bring out the eminent position of IIT Kharagpur among IITs. The need to do a systematic and in-depth analysis to arrive at 'impact' parameter is clear. Further, such an analysis should take into account other factors such as the number of Ph D's in engineering/technology, number of consultancy and sponsored projects and interactions with industry. Just to give a feeling of the numbers, IIT Kharagpur produces over 100 Ph D's per year, undertakes about 200 projects worth over Rs 1.00 crore as consultancy fee and over Rs 6.00 crore as sponsored R&D projects. Besides, our 30 faculty members have established enterprises, based on their work, in our Technology Park.

Finally, let me emphatically state my faith in critical assessment and accountability of any institution. Indeed, if we do ever hope to see decent standards of R&D in our country, it will be possible only after we have learned to conduct impartial, objective and ruthless peer

reviews by nongovernment organizations. Some belated steps taken by UGC and AICTE for accreditation of academic institutions continue to be controversial. It is most unfortunate that our several Academies have failed to appreciate their responsibility to serve the country in this direction. What we need is fiercely independent organizations such as those existing in USA and UK to examine the credentials of each department of an educational institute. We will reach maturity only that day when such an organization will undertake comprehensive analysis to publish publicly 'grades' earned by our academic departments and institutions.

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NEWS

Report on the 'International conference on symmetry methods in physics' (ICSMP-95)

The VIIth ICSMP-95, held at the Bogoliubov Laboratory for Theoretical Physics, Joint Institute for Nuclear Research, Dubna, from 10 to 16 July 1995, is the seventh conference in a series, the first five of which were organized by Yu A. Smorodinsky and the sixth was devoted to his memory. This conference was inaugurated by A. N. Sissakian (JINR), and D. V. Shirakov gave some statistical details about the Bogoliubov Laboratory of Theoretical Physics of JINR, where research is carried out in the areas of fields and particles, nuclear theory and theory of condensed matter.

The first (40 min) Invited Talk was by H. D. Doebner (Germany), who spoke on 'Infinite-dimensional symmetries and nonlinear physics'. There were in all 12 Plenary Sessions in which 44 Invited Talks were presented, and 18 Parallel Sessions, in which 85 contributions (of 30 or 20 min duration) were presented. From India, there were three invited

speakers (the two authors of this report and M. Lakshmanan of the Bharathidasan University, Tiruchi).

Broadly, the topics covered included the following: dynamical symmetries and integrable models; symmetry and non-linear phenomena; special functions and group representation theory; quantum algebras and groups; supersymmetry (SUSY) from quantum mechanics to elementary particles; gauge and conformal theories; symmetries in condensed-matter physics and statistical mechanics; geometric methods in quantum mechanics and quantum field theory; quantum optics and coherent states; and mathematical methods.

In a review of the renormalization group (RG) method introduced 40 years ago by Peterman and Stueckelberg, Gell Mann and Low, and N. N. Bogoliubov, D. V. Shirakov (JINR) pointed out that this work led K. Wilson to apply RG method to critical phenomena in the 1970s and

that recent analysis identifies the RG with functional self-similarity. In his invited talk 'RG, solution symmetry and Lie group analysis', Shirakov said that Wigner's 1963 Nobel lecture traced the laws of Nature as derived from symmetry and invariance principles and these laws, in turn, explained physical phenomena. The Bogoliubov RG method adds to this scheme Lagrangian parameters and boundary parameters as inputs to the laws of Nature and the physical phenomenon respectively.

P. Winternitz (Canada) in his invited talk on 'Continuous and discrete symmetries of differential-difference equations' showed how the established Lie group analysis of ordinary differential equations (ODE) has been extended to the study of differential-difference equations. The three different approaches to the Lie point symmetries of discrete equations are beginning to converge and similar analysis of q -difference equations