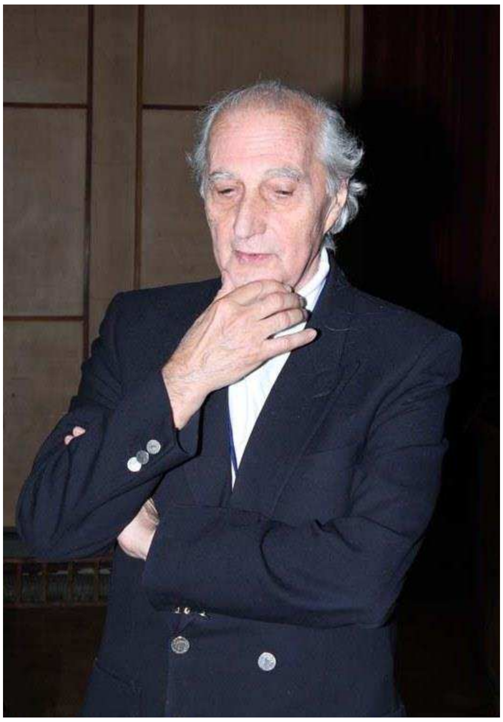
Journal of Theoretical and Applied Mechanics, Sofia, Vol. 47 No. 4 (2017) pp. 86-92

LIFE IN SCIENCE

PROF. DSC ANGEL I. BALTOV, CORRESPONDING MEMBER OF THE BULGARIAN ACADEMY OF SCIENCES, AND HIS CONTRIBUTIONS TO SOLID MECHANICS



We are honoured herein to present the long and remarkable scientific career of Prof. Angel I. Baltov, a renowned researcher in the field of Solid Mechanics at the Institute of Mechanics, BAS. The short CV enclosed proceeds with an interview, where our colleague discloses the essential steps of his career.

SHORT CV OF PROF. ANGEL BALTOV

Born 1935 in Sofia. High school graduation – 1953. Enrolled in the University of Architecture and Civil Engineering (former Higher Institute of Civil Engineering), 1953. MS in “Industrial and civil engineering”, 1959. Appointed to a post of civil engineer, State Company “Plant Construction”, 1959-1961. Joined in 1961 the Institute of Water Construction and Engineering at the Bulgarian Academy of Sciences (BAS), forerunner of the Institute of Technical Mechanics (BAS), which was later transformed into Institute of Mechanics, BAS.

Academic carrier : Elected research associate (assistant professor), 1963; Defended PhD thesis, Institute of Fundamental Technological Research, Waszawa, Poland, 1967; Elected II-nd degree senior research associate (associate professor), IMech, BAS, 1973; Defended DSc thesis, Institute of Mechanics (IMech), BAS, 1985; Elected I-st degree senior research associate (full professor), IMech, BAS, 1986; Elected corresponding member of BAS, 2004.

Research fields : Solid mechanics, Applied mechanics, Mechanics of materials, Structural mechanics.

Research activities : Author of more than 250 research papers; co-author of 6 monographs.

Leading positions : Head of department "Solid Mechanics", IMech, BAS; Scientific Secretary of IMech, BAS; Scientific Secretary of BAS; Vice-Dean of Faculty of Mathematics and Mechanics, Sofia University "St. Kl. Ohridski"; Rector of PhD Research Career Center, BAS; Member and Head of the National Committee of Theoretical and Applied Mechanics; Coordinator of a number of national and international research projects, funded by National Fund "Scientific Research", EU, NATO, etc.

Awards : Departmental and national.

Editorial : Member of the editorial boards of a number of national and international scientific journals.

INTERVIEW

Prof. Baltov, how did you turn to scientific research?

By predetermined accident! My desire was to do scientific research. Prof. D. Kolarov, my diploma thesis supervisor, whom I met by accident after my graduation from Sofia Polytechnic, advised me to join the newly established Technical Department at Bulgarian Academy of Sciences (BAS). I agreed although my salary was twice less than that paid by "Zavodski stroezhi (Plant Construction)" – a state company I was under an obligation to work for after graduation.

What gave an impetus to your research?

The policy of Acad. Brankov, Director of Institute of Technical Mechanics, BAS, was to direct young researchers to do post graduate studies in states of the former

Eastern block. Prof. Al. Rachev and I enrolled as PhD students in Institute of Fundamental Technological Research at Polish Academy of Sciences, Poland. However, the institute was and is still a world renowned research center on mechanics.

Who were the scientists with the strongest impact on your career?

Prof. D. Kolarov, in the first place. Secondly, I was happy to meet a number of world famous researchers during my stay in Poland. These were Acad. A. Sawczuk, Prof. Perzyna, Acad. Mroz and others, who taught me "the trade".

Which are the stages in your career that you consider to be the most important ones?

1. *Most of all, the period of my successful collaboration with colleagues from Institute of Mechanics (IMech), BAS. These are Prof. N. Boncheva, in the first place, Prof. R. Dobrev, Prof. J. Ivanova, Assoc. Prof. V. Valeva, Assoc. Prof. L. Parashkevova, Assoc. Prof. R. Kazandjiev, Assoc. Prof. A. Yanakieva and Assoc. Prof. N. Nikolov, whom I have collaborated with recently, as well as many others.*

2. *Participation in a number of national and international projects of expressed applied character.*

3. *Participation in a number of international research projects - bilateral, multilateral, European ones etc., whose scope enabled us to collaborate with scientists from Poland, France, Germany, former USSR, former Czechoslovakia, Romania etc. My specific collaboration with Prof. Vint, Prof. Zarka, Prof. Dragon from France, Prof. Lippmann from Germany, Prof. Mayer from Italy and others, is also worth noting.*

4. *My PhD studies in Poland and my specializations in Poland, France, Germany, and Italy.*

5. *Occupation of important scientific-organizational posts: Scientific Secretary of IMech, Deputy Head of the former Faculty of Mathematics and Mechanics at Sofia University, Head of department at IMech, Scientific Secretary of BAS and Rector of PhD Research Career Center, BAS.*

6. *Supervision of the thesis preparation of PhD students, who are now nationally and internationally recognized scientist.*

Which are your scientific results that you highly prize?

1. *Modeling of the deformation anisotropy induced in plastically deformable solids with an account of a number of important factors, such as strain rate, process history, temperature, microdamage etc. I especially treasure the Rule of Anisotropic Hardening designed jointly with professor Sawczuk, which really made its way up. This was for some time a leading issue in our department gathering momentum thanks my scientific collaboration with Professor N. Bontcheva, Assoc Prof. R. Kazand-*

jiev, Assoc. Prof. L. Parashkevova and other colleagues.

2. *Adequate modeling of the formation of strain localization bands in plastically deformable solids. Interesting results emerged in collaboration with Prof. N. Bontcheva, Prof. Lippmann, Prof. Kafka, Prof. Vint, Acad. Vodentcharov and other colleagues.*

3. *Design of a cybernetic model of a deformable solid. An efficient calculation procedure was developed on its basis involving finite systems (mainly discussed in my D.Sc. thesis).*

4. *United approach to the description of material diverse resistance to mechanical impacts. The results were published in an invited paper included in the Jubilee Ukrainian issue of the Journal of Applied Mechanics, devoted to the new Millenium.*

5. *Design of adequate multi-level models of new structural materials (nanomaterials, intermetallics etc.) as part of the tasks of various European projects.*

6. *Development of a complete theory of structural elements reinforced via thin layers, considering the development of transition areas in the material. Approximate and practically convenient calculation procedures were developed on that basis. The research was done in collaboration with Assoc. Prof. A. Yanakieva.*

You have published a number of monographs. Do you have some specific comments?

I find three books worth mentioning:

1. *"Theory of plastic media", a joint work with Prof. D. Kolarov and Prof. N. Boncheva (in Bulgarian). The book is based on a united theoretical concept – the thermodynamics of systems with internal state parameters. It is translated in Russian and published by the prestigious publishing house "Mir", Moscow. Its citations are numerous.*

2. *"Mechanics of materials", jointly written with Prof. M. Popova. It is designed both as a research study and a textbook for students at the Chemical-Technological and Metallurgical University of Sofia. The monograph is based on a united concept of multi-level material modeling, being the first work in Bulgaria with such a structure and objectives.*

3. *"Energy-saving and surface-reinforced structural elements with transition areas", a joint work with Assoc. Prof. A. Yanakieva. The monograph looks at the mechanics of solid bodies (Mechanics of structures) in the case of thin layers on the structural elements, when the layers are realized by diffusional techniques. The book is addressed to scientist in follow areas "Solid Mechanics" (Mechanics of structures) and soil and mechanical engineers with specializations, "Structural Mechanics" for thin layers, "Applied Mechanics" and "Tensile tests".*

Are there any other activities of yours that you prize and would bring forward?

1. *Editorial work for "Journal of Theoretical and Applied Mechanics", issue of BAS, member of the editorial boards of a number of popular Bulgarian and foreign scientific journals, reviewer of the first Bulgarian collection of scientific papers on mechanics of nanomaterials, "Mechanics of Nanomaterials and Nanotechnology", IMech, Vol.3, Sofia, 2012.*

2. *Development of Educational Regulations for PhD. students, BAS.*

3. *The first courses on "Solid Mechanics", "Mechanics of Materials", "Mechanics of Nanomaterials", "Links Between Engineering and Architectural Design", taught in Bulgaria.*

4. *Participation in the Bulgarian Commission on Engineering and Military Science.*

Which are your most prized insignia of honor?

1. *Corresponding Member of BAS.*

2. *Doctor Honoris Causa of the Higher School of Civil Engineering "L. Karavelov", Sofia.*

3. *Chairman of the National Committee of Theoretical and Applied Mechanics.*

4. *Bearer of the order of "Cyril and Methodius" and the medal with ribbon "Marin Drinov" of BAS.*

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