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CHRONICLE

GUSTAV VANAGS MEMORIAL LECTURES

O. Neilands

The Gustav Vanags Memorial Lectures took place on February 14, 2000 in Riga, Latvia. Professor G. Vanags was born on March 10, 1891 and died on May 8, 1965. He founded the school of organic chemists in Latvia and carried out research on the chemistry of 1,3-indanedione. Latvian chemists noted the 109-th anniversary of his birth and 35-th anniversary of his untimely death. Many of his direct students, despite their advanced age, continue research in organic chemistry, including Academicians E. Gudriniece, O. Neilands, G. Duburs, E. Grens, E. Lukevics, J. Freimanis, A. Strakovs, and R. Valters. Students of the students of Prof. Vanags occupy an outstanding position in scientific and teaching work. The third and maturing fourth generation of Latvian organic chemists have greater knowledge and perspectives since they have the advantage of the experience of their predecessors.

The Gustav Vanags Memorial Lectures, in which both Latvian and non-Latvian organic chemists participate, have taken place since 1967. Outstanding organic chemists such as V. V. Perekalin, V. F. Kucherov, B. A. Porai-Koshits, L. S. Efros, N. N. Khromov-Borisov, A. N. Kost, I. P. Beletskaya, Yu. N. Sheinker, etc. had participated in them.

Professor Vladimir Khodorovsky of Ben Gurion University of Negev in Beer Sheva, Israel and Dr. Aivar Krauze, an researcher of the Latvian Institute of Organic Synthesis, presented reports at the Twenty-Fifth Gustav Vanags Memorial Lectures.

Prof. V. Khodorovsky graduated from the Chemistry Faculty of the Riga Polytechnical Institute in 1980. In 1986, he defended Chemical Science Candidate's Dissertation on the chemistry of tetrathiafulvalenes. Since 1991, he has been working at the Chemistry Department of the Ben Gurion University of the Negev and has continued his work undertaken in Riga on the chemistry of tetrathiafulvalenes and 1,3-indanedione. In his report on the "Design of Strong Organic Electron-Withdrawing Molecules: A Pathway Indicated by C_{60}," Prof. V. Khodorovsky investigated the chemistry of 1,3-indanedione and the use of this compound in the synthesis of electron-withdrawing organic compounds. The pattern of the surface of fullerene, C_{60}, consisting of six- and five-membered rings, permits to see various combinations of condensed rings, including indanedione, bindone, diindanedionylidene, fluorene, and bifluorenylidene. In this case, fullerene, C_{60}, is an electron-acceptor of medium strength. In his report, Prof. V. Khodorovsky considered the synthesis and properties of bis-2,2-indanediylidene-1,1',3,3'-tetraone and 2-(cyclohexadienylidene)indane-1,3,4'-trione and the structure of the products of self-condensation of three and more indanedione molecules, including the structure of so-called "green isobindone." The preparation of electron-withdrawing molecules by the condensation of malononitrile with the products of the self-condensation of indanedione, including truxenequinone and dodecafluorotruxenequinone, was examined. The reactions of *symm*-indacene-1,3,5,7(3H,6H)-tetraone, including its nitration, were discussed. The synthesis of this compound from pyromellitic dianhydride and ethyl acetoacetate was examined. Prof. V. Khodorovsky noted that many of the products of the condensation of derivatives and analogs of indanedione with dialkylaminobenzaldehydes and cinnamaldehydes have marked non-linear optical properties. Part of his report was devoted to the chemistry of tetranitrofluorene and pentanitro-9-phenylfluorene as precursors in the synthesis

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of strong electron acceptors and compounds with non-linear optical properties. The structures of most of the compounds synthesized were confirmed by X-ray diffraction analysis. Some of the studies noted were carried out in conjunction with the Organic Chemistry Department of Riga Technical University headed by Prof. O. Neilands, which bears witness to continuation of the study of indanedione chemistry initiated by Prof. Gustav Vanags.

Doctor of Chemistry Aivar Krauze, who graduated from the Chemistry Faculty of the Riga Polytechnical Institute in 1975, presented a report on "Semithiomalonodiamides as Efficient Synthones for the Preparation of Alternative Heterocycles," in which he reported the results of studies of the complex multicomponent system reactions products – derivatives of hydrogenated pyridines. The reaction of benzylidenemalononitrile, thiocarbamoyl(N-substituted)acetamide, and chloroacetone in the presence of an amine as a catalyst under mild conditions gives a derivative of the 7H-thiazolo[3,2-*a*]pyridine system, namely, 3-hydroxy-2,3-dihydro-7H-thiazolo[3,2-*a*]pyridine-8-(N-substituted)carboxamides. A mixture of arenecarbaldehyde and malononitrile can be used in this reaction. The mechanism of this multistep reaction was established. 4,4-Dicyanobutyrothioamides, 3-carbamoyl-1,4-dihydropyridine-2(3H)-thiones, and 3-carbamoyl-2-acetylmethylthiodihydropyridines were postulated as intermediates in this reaction. Alternative products, namely, 3-(1',3'-thiazolyl-2'-yl)-3,4-dihydropyridin-2(1H)-ones, the corresponding 2(1H)-pyridinones, and some intermediates, were isolated by the raising the reaction temperature or changing the order of addition of the reaction components. These products hold interest as potential antioxidants, hepatoprotectors, vasodilators, and blood pressure regulators.

These memorial lectures brought organic chemists to the auditorium of the Faculty of Chemical Technology (now the Faculty of Materials Science and Applied Chemistry) of the Riga Technical University and reminded us that the work initiated by Prof. Vanags continues to develop and bear fruit.