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PROFESSOR ADOLF VENIAMINOVICH BUTKEVICH (1914-1983) - HEAD OF THE DEPARTMENT OF SPACE GEODESY AND ASTRONOMY OF THE LVIV POLYTECHNIC

(on the 100th anniversary of his birth)

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Fig. 1. Adolf Butkevich

The famous Russian astronomer, surveyor and mathematician, the first and the last head of the Department of Space Geodesy and Astronomy (DSGaA) Lviv Polytechnic Institute (LPI, now the National University Lviv Polytechnic), Professor, Doctor of Technical Sciences Adolf Veniaminovich Butkevich (Fig. 1) was born June 18, 1914 in the village Tisul Kemerovo Oblast (Russian Federation) [1, 2, 3, 8, 9, 27, 36, 43].

After graduating from high school, he worked on mine surveying works (1929-1932). Then attended a course technicians topographers, courses triangulators and preparatory courses (1932-1935) for admission a higher education institution at a working faculty of Tomsk State University (now the National Research Tomsk State University) and at the same time worked as a technician and senior technician - surveyor on the geodesic production [1, 43].

Higher education received in the 1935-1944 years on the Astronomical and Geodesic faculty of Novosibirsk Civil Engineering Institute V. V. Kuibyshev (with 1998 Novosibirsk State University of Architecture and Civil Engineering). During his studies, he taught mathematics in courses topographers and Geodesy in topographical College and worked at the geodetic enterprise topographer - surveyor and assistant chief of the party. Then enrolled in graduate school and became an assistant to the Department of Astronomy of the Novosibirsk Institute of Engineers Geodesy, Aerial Survey and Cartography (NIIGAiK now the Siberian State Academy of Geodesy), where he worked until 1968. In this same time until 1951 he worked moonlighting at a geodesic enterprise, and in 1951-1952 he was the head of the astronomical party 1st class. He completed graduate studies in 1947, and in 1950 he defended his thesis on «*Reshenie glavnoi geodezicheskoi zadachi na steroide pro znachitelnyh rasstoianiiah*» (Solving the main problem on the geodesic spheroid at considerable distances), scientific director of which was an outstanding Russian and Belarusian scientist - surveyor Professor Vasilii Vasilievich Popov (*1887-†1955), later academician of the Belorusian SSR (1950). Soon, him was awarded the title of associate professor (1951), and in 1960 professor, which confirmed in 1964 defense of his doctoral thesis on theme «*Reshenie nekotoryh osnovnyh i specialnyh zadach vysshei geodezii*» (The solution of some basic and special tasks Higher Geodesy) in Moscow Institute of Engineers Geodesy, Aerial Survey and Cartography (MIIGAiK; now the Moscow State

University of Geodesy and Cartography) [12, 13, 43].

At the same time worked as a lecturer of the planetarium (Rev. 01/15/1952), which belonged to the Novosibirsk regional branch of the Society for the Dissemination of Political and Scientific Knowledge of the RSFSR (now the Society «Znanie»), was a member of the Novosibirsk Branch of All-Union Astronomical and Geodesic Society (VAGO) at the Academy of Sciences of the USSR [1, 43].

It should be noted that A. V. Butkevich considered himself a disciple of a prominent Russian scientist in the field of aerodynamics and flight dynamics in V. P. Vetchinkin (*1888-†1950), a pupil of N. E. Zhukovskii (*1847-†1921), the largest Soviet specialist on the methods of approximate calculations, which during the second world war worked in Novosibirsk. Probably since he kept the manuscript labor V. P. Vetchinkin «*Eternal Solar - Star Calendar*», o which he told and showed the students. At this, he also mentioned that V. P. Vetchinkin every night out on the street to help with his own fabricated device check the clock on the North Star. Scientist took over from him the love to of approximate calculations, nomograms, and in particular, to calendars that later manifested in the works of the A. V. Butkevich and his students [1, 19, 24, 43].

In 1968, at the invitation of the Rector LPI Professor Grigorii Denysenko (*1919 - †1998) moved to Lviv, where he headed the new department SGA. After its reunification in 1974 with the Department of Higher Geodesy and Gravimetry (Head Professor N. K. Migal) called the Department of Higher Geodesy and Astronomy (DHGA, Head Associate Professor V. A. Kovalenko) worked as a professor of the department (1974-1983). Throughout his work in LPI Professor A. V. Butkevich lectured and conducted seminars and laboratory training on courses Space Geodesy, Higher Geodesy, Geodetic Astronomy, Basics Space Geodesy, Basics of scientific research and the Introduction in specialty. In addition, he was invited to give lectures and other universities in Ukraine, for example, in March 1977, he lectured on individual sections «Higher Geodesy» (part II) in Krivyi Rih Mining Institute (now the Krivyi Rih National University), and in October of the same year a lectures on «*Ispolzovanie matematicheskih metodov v zemleustroistve*» (Application of mathematical methods in land planning) in Lviv Agrarian Institute (now the Lviv National Agrarian University). From 12 to 23 November 1969, he lectured on the achievements of Soviet science in People's Republic of Bulgaria (PRB; now the Republic of Bulgaria) [1, 10, 23, 30].

Head DSGaA tried to ensure its modern of astronomical and surveying instruments and technologies, in particular, has made efforts to create at the Department of satellite station, which, unfortunately, could not be implemented. Much attention is paid to ensure the educational process of scientific - methodical literature. Was the author of methodical guidelines for laboratory work, cards for programmed control and of individual tasks for students IV - V courses. They were delivered six new laboratory work on the space geodesy and fundamental research. Unfortunately, no there were published textbook «*Osnovy nauchnyh issledovanii*» (Basics of scientific research; volume 10 printed pages), prepared in collaboration with professors V. Ya Finkovskii (*1913 - †2002), N. G Viduev (*1910 - †1980) and I. F. Monin (*1920 - †2001), and course lectures the «*Osnovy nauchnyh issledovanii*» (Basics of scientific research) [1, 43].

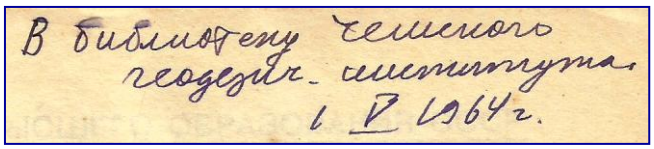

Fig. 2. Inscription A. V. Butkevich on the flyleaf of the first volume of «Trudy Novosibirskogo instituta inzhenerov geodezii, aerophotosiemki i cartographii» (1947)

Professor A. V. Butkevich was authored and co-authored more than 250 scientific and popular articles, book reviews, monographs, tables, for example «*Tablitsy dlia perevychisleniia ploskih priamougolnyh koordinat Gaussa iz odnoi zony v druguiu*» (1969; Tables for conversion of the plane rectangular coordinates Gauss from one zone to another), and books on Geodetic Astronomy, Spheroidal Geodesy, Mathematical Cartography and Applied Mathematics, published in the USSR and abroad. His articles are published in the following journals and collections: «*Astronomicheskii Zhurnal*» (Moscow), «*Problemy astronomii i geodezii*» (Moscow), «*Geodezia i Cartographia*» (Moscow), «*Trudy TsNIIGAiC*» (Moscow), «*Sbornik stattei GUGK*» (Moscow), Proceedings of Higher Education «*Geodeziia i aerophotos'emka*» (Moscow), «*Vestnik VIKA im. Kuibysheva*» (Moscow), «*Novye knigi za rubezhom*» (Moscow), «*Trudy Novosibirskogo inzhenerno-stroitelnogo instituta*» (Novosibirsk), «*Trudy Novosibirskogo instituta inzhenerov geodezii, aerophotosiemki i cartographii*» (Novosibirsk), «*Geodeziia, cartographiia i aerophotos'emka*» (now the «*Geodeziia, cartographiia i*

aerophotoznimammia», Lviv), «*Geodetický a kartografický obzor*» (Prag, Czechoslovakia - ČSSR), «*Soviet Astronomy*» (New York, USA) etc. Best well known and has not lost its value monograph «*Issledovaniia po resheniiu vychislitelnyh zadach sferoidocheskoi geodezii*» (1964; Research on decision computational tasks the Spheroidal Geodesy). Two of his works were translated into English and is now available in the world's largest bibliographic database «WorldCat» (http://www.worldcat.org/) World Online Computer Library Center - OCLC (Online Computer Library Center - http://www.oclc.org). Four more have been translated into Czech with the assistance of the Scientific-Research Geodetic, Topographic and Cartographical Institute (SRGTCI; Zdiby, ČSSR, now the Czech Republic), and generally in the digital bibliographic database «Surveying Library» Institute recorded about 130 teeing it works , some of which he personally sent to the library (fig. 2). About 30 works A. V. Butkevich included the digital bibliographic database «Astronomy» Astrophysics System Data NASA, which is maintained by Harvard University (USA). It should also be noted that some of them derived formula continued to live their lives and improved foreign researchers [1, 11, 17, 18, 29, 36, 41].

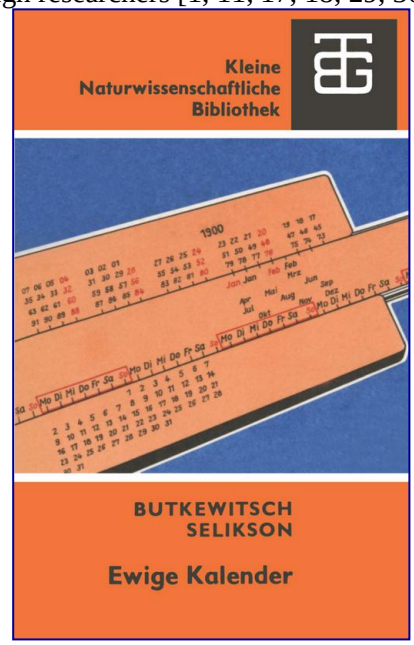

Fig. 3. Title Page German edition A. V. Butkevich and M. S. Zelikson «Ewige Kalender»

Were also interested his non-fiction articles in magazines «*Zemlia i Vselennaia*», «*Priroda*», «*Znanie-Sila*», «*Tekhnika Molodezhi*», «*Uralskii sledopyt*» etc., and as well in various newspapers, including Lviv, for example «*Lvovskaia Pravda*», «*Leninska molod*» (now the «*Moloda Halychyna*») and «*Radanskyi student*» (now the «*Audytoriia*»). Several editions withstood his book «*Vechnyie calendari*» (Perpetual calendars, 1969, 1984), which was also translated into German and for titled «*Ewige Kalender*» (fig. 3) was published sixfold in the German Democratic Republic (GDR; now the Federal Republic of Germany; 1974, 1976, 1978, 1982, 1987, 1989). He did not refuse to write articles to the anniversaries of their colleagues and Geodetic Survey, reviewed on achievement of the USSR in the exploration of the universe, and appeals to the public on the occasion of the fall of meteorites and solar eclipses, etc. [1, 19, 20, 22, 38].

Owning several languages helped scientist be keep abreast of domestic and foreign news in its industry, and high erudition - determine the most interesting work and recommend them to explore young scientists, graduate and students. Not surprisingly, him was commissioned to write an article «*Nivelirovanie*» (Leveling), «*Sposob Talcotta*» (Horrebow-Talcott Method) end «*Stadimetricheskie krivye*» (special case - the Line of position) for the third edition of «*Bolshaia sovetskaia encyklopediia*» (Great Soviet Encyclopedia). In addition, he led a great job of translating and editing books foreign scientists. So, in 1967 was in publishing house «Mir» released translated from English A. V. Butkevich, A. Padve, E. A. Mogilevskii and K. M. Antonovich book Ivan Mueller «*Vvedenie v sputnikovuiu geodeziiu*» (Introduction to Satellite Geodesy), in 1971 and 1975 in publishing house «Nedra» - translated from Czech A. V. Butkevich, B. N. Dyakov and V. V. Kirichuk (*1940-†1988) book famous Czech Scientist - Surveyor Milan Burša «*Osnovy kosmicheskoi geodezii*» (Základy kosmické geodezie; Fundamentals of Space Geodesy) in 2 parts, etc. [1, 6, 7, 14, 15, 28, 37].

Adolf Veniaminovich maintained close scientific contacts with scientists from Czechoslovakia, in particular with SRGTCI, PRB and GDR. One consequence of this was such that the department DSGaA received from SRGTCI the abstract journal «*Literární hlídka*» (now the «*Novinky Zeměměřické knihovny*»), which published abstracts of interesting articles from the the collections «*Geodeziia, cartographiia i aerophotos'emka*» (Lviv) and other geodetic periodicals USSR [1, 29].

Along with teaching and research work of Professor and spent most fruitful work as the third chairman of the Lviv branch VAGO - LviVAGO (1970-1983), as a lecturer and member of the Scientific and Methodological Council and

sections of Physical and Mathematical Sciences of the Lviv regional board of the «Znannia», as a member of editorial boards of several scientific-technical journals, proceedings of conferences and meetings, for example book of abstracts Union Conference on theme «*Sovremennye metody ucheta i iskliucheniia vliianiia refrakcii světových voln pri geodezicheskih a astronomicheskih izmereniiah*» (Modern Methods of Allowing for and Eliminating the Influence of Refraction of Light Waves in Geodetic and Astronomical Measurements), which took place on 16-19 April 1974 in Lviv. Much time paid Adolf Veniaminovich work on the editorial board in the Republican collection «*Geodeziia, cartographiia i aerophotos'emka*», conducted section in All-Union journal «*Geodeziia i Cartographiia*», was referent All-Union references journal VINITI «*Geodeziia i aeros'emka*», wherein joined to abstracting also a number of his students, including authors article. As recalled by his student and colleague of Professor NIIGAiK K. M. Antonovich, he wrote Referats and on scientific articles in Chinese, they say *«A chto zdes slozhnogo: geodezicheskie formuly na vseh iazykah poniatny!»* (And what is so tough, geodetic formulas in all languages understood!) [1, 42, 43].

Professor have lot of students - graduate students. Under his leadership, nearly 15 of them defended their dissertations. This Head of the Department of Higher Geodesy and Astronomy Professor F. D. Zablockii, Head of the Department Higher Mathematics Tomsk State University of Architecture and Building Professor N. G. Berezin, Associate Professor of the Department of Engineering Surveying National University of mineral resources «Mountain», Saint Petersburg (Russian Federation) B. N. Dyakov, Associate Professors V. V. Kirichuk and M. I. Rusyn, as well Ye. M. Mogilevskii, V. M. Krasnikov, P. E. Minekes, Ye. M. Voronoj, V. G. Kirillov, Tranh Zui Thoang (Vietnam), etc. [1, 43].

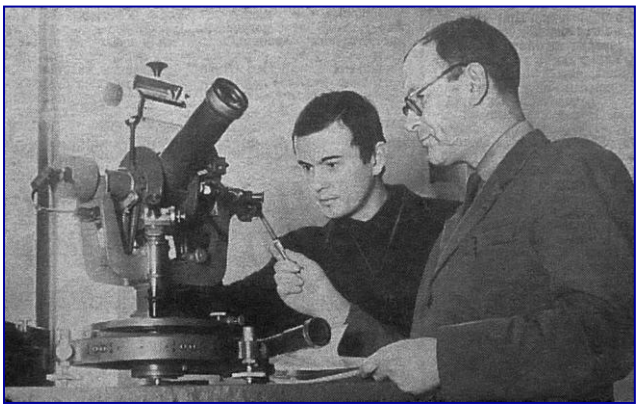

Fig. 4. Prof. A. V. Butkevich consult the student group AG-32 Vadim Vekov - «*Radanskyi student*» (1968)

For perform consultation with students, graduate and colleagues Adolf Veniaminovich spared no time (fig. 4). He never refused to help with advice or edit an article. If necessary, rewrote his own articles and send them to his disciples, for example, in 1972, he rewrote the article «*O nekotoryh uproshcheniiah obrabotky azimutalnyh opredelenii*» (O some simplifications azimuth processing definitions, 1950) , and sent it to one of the authors, who then performed astronomical observations 1 - grade on points Laplace and , in particular, defined astronomical azimuths sides triangulation of by Polaris. Article hitherto stored in its archive [1, 43].

Simplicity, communicability, accessibility, and adherence to principles with colleagues and students, cause respect for him. However, the professor did not avoid witty words and humor. Widely known and to this day there are tens of his aphorisms-quip, both in Novosibirsk, so and in Lviv, which he wrote in the margins of student research papers and diploma works, or expressed at their discussion. This example «*Vy poluchaiete tochnost v polkrokodila*» (You get precision half crocodile), «*Saldo-Buldo*», «*Vy razvodite glubokuiu filosofiiu na melkom meste*» (You breed a profound philosophy at a shallow place), or if someone forgot to make references to the sources, in particular on the work of Professor, then «*Karaul! Grabiat!*» (Help! Rob!), etc. And who among former students and colleagues does not remember his phenomenal abilities and memory. Adolf Veniaminovich can quickly find the error in the calculations made using the eight-table, not looking at these tables, calculate logarithms of numbers and trigonometric functions with up to five decimal places, etc. [1, 43].

A lot of effort attached Adolf Veniaminovich for organization and construction in Lviv the large planetarium. Unfortunately, the then city officials supported this idea only on paper. He also tried to restore the activity of the Polish-meteorological astronomical observatory named Jozef Pilsudski on one of the highest peaks of the ridge of Chernogora - Pip Ivan mountain (2022 m above sea level) in the Ukrainian Carpathians. On his initiative, at the Palace of Culture of Railway beginning in 1969 working folk Observatory and Planetarium, and in some schools and Lviv region and station of young technicians - astronomical observatory and school clubs. Students who attend these institution, then the comes to study on the Geodesic Faculty (now the Institute of Geodesy) Lviv Polytechnic. In LPI professor led a school young lecturer and prepared a lot of highly qualified lecturers. With a story

about work LviVAGO he performed on the 7th Congress in VAGO (Almaty, 2-5.12.1980) and there he was elected member of the Central Council of the Society. He also participated in the 5th Congress VAGO (Kazan 23-28.11.1970) and the Jubilee Conference in Jūrmala (now the Republic of Latvia) 8-10 February 1983, dedicated the 50th anniversary VAGO [4, 5, 16, 25, 26, 30, 33, 34, 35, 40, 43].

The scientist was a member of a specialized academic council for the defense of doctoral theses, which often affirmed opponent and took part in the discussions. He also spoke at meetings of the Academic Council of the Faculty at scientific conferences and seminars at various levels, including student, in the House of Scientists, in Central lecture hall, hostels, factories, etc. His popular science lectures on astronomy, space exploration and on the development of science and technology, which is 20-30 times per year performed were logically constructed and filled with information about the latest achievements of science and the possibility of their implementation. Especially popular were his lectures on the search for extraterrestrial life, UFO and aliens on Earth traces etc. [1, 5, 43].

Despite the workload of a professor found time for sports. He was one of three in the USSR master of sports on drafts composition, ie «shashechnym composer», moreover, - for the preparation of more than 10 masters of sport, he was awarded the title «Zasluzhenyi trener SSSR» (Honored coach of USSR). Adolf Veniaminovich exerted great efforts to popularize the game of checkers to the public, in particular, led the column checkers in the newspaper «*Lvovskaia pravda*», and in 1985 published his book «*Shashechnye okonchaniia - miniatiury*» (Draughts Closure - Thumbnails), written in co-authored with M. Ya. Levandovskii [1, 21, 43].

Among hobbies scientist were and books. He was a famous the bibliophil and bibliographer, the owner interesting Library. In collaboration with Assistant Professor I. M. Gudz compiled and published in the collections «*Geodeziia, cartographiia i aerophotos'emka*» (1975, 1976) of the first bibliography of Lviv Scientists - Surveyors, who came in 1949-1974. Unfortunately, subsequently found no one who would have continued this bibliography to our time. About interesting new books professor often and enthusiastically told students and colleagues [1, 17, 18, 43].

Down His life until the last of Adolf Veniaminovich dedicated geodetic science and training of highly qualified scientists and engineers - surveyors. His work has been deservedly awarded state and departmental awards - medals «Za doblestnyi trud v Velikoi Otechestvennoi voine 1941-1945 gg.» (For Valiant Labour in the Great Patriotic War of 1941–1945; 1945) end « Za pobedu nad Germaniei v Velikoi Otechestevennoi voine 1941-1945» (For the Victory over Germany in the Great Patriotic War of 1941–1945; 1945). Society «Znanie» awarded him the Medal named after M. V. Lomonosov (1962), Main Office of Geodesy and Cartography under the Council of Ministers USSR - badge «Otlichnik geodezii i cartographii» (Excellent in Geodesy and Cartography, 1969) a VAGO elected an honorary member (1980) [2, 3, 27, 35, 43].

Scientist died July 11, 1983 and is buried in the Yaniv cemetery in Lviv [2, 43].

In 2013 marks 30 years since the death, and in 2014 will celebrate 100 years since the birth of Professor A. V. Butkevich. The authors hope that this first biographical article about a scientist not only remind the geodesic public the Lviv and of Ukraine o one of the most famous Scientists - Surveyors of Lviv Polytechnic, but also serve the development of comprehensive cooperation Surveyors Ukraine and Russia.

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Professor Adolf Veniaminovich Butkevich (1914-1983) - Head of the Department of Space Geodesy and Astronomy of the Lviv Polytechnic

(on the 100th anniversary of his birth)

A. Drbal, I. Trevoho

The article describes the life, professional, pedagogical and social activities of the eminent Russian astronomer, surveyor and matematiker Professor Adolf Veniaminovich Butkevich (1914-1983). Particular attention is paid to his activities in the Lviv Polytechnic.