Національний Педагогічній Університет
імені М. П. Драгоманова

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Interdisciplinary research center
for complex systems

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Ювілеї у редакційній колегії

Jubilees in the Editorial Board

Віктор Андрущенко
Viktor Andrushchenko

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Галактика Віктора Андрущенка

Наша Галактика, спірально обертаючись, являє собою потужний магніт, котрий притягує у своє тіло нові сонця і нові зірки, залишаючи старі, що вже вичерпали свою енергію, розчинятися, перетворюючись у космічний пил. У своєму русі Галактика слідує у напрямку еволюції, творячи нову красу Всесвіту.

Кажуть: «Як на небі, так і на землі»... Є люди-магніти, які своєю активністю, своєю гармонією із завданнями еволюції, будують свої земні галактики, притягуючи до них людей-сонць і людей-зірок. Ось уже 16 років поспіль Віктор Андрущенко будує свою галактику — Національний педагогічний університет імені М.П. Драгоманова. Будує у складний час політичних протистоянь та економічної нестабільності, революцій, пошуку суспільством моральних орієнтирів і нового науково-філософського розуміння світу в умовах небаченого прискорення життя та зростаючого обсягу інформації.

Тоді, коли магістральним шляхом розвитку еволюції є синтез, ВікторАндрущенко також являє собою своєрідний синтез, поєднуючи у собі філософа, педагога, вченого і талановитого менеджера. Цю цілісність (як прояв культури) ми відчуваємо в усьому університеті: тут картинна галерея портретів від київських князів до героїв сучасної України; один із кращих музичних факультетів Києва, неймовірний хор; наукова бібліотека, з використанням сучасних технологій і дбайливим ставленням до свого архіву; Центр міждисциплінарних досліджень складних систем з діючим при ньому науковим семінаром, де українські та зарубіжні вчені готують свої доповіді. На ці семінари приходять студенти, які можуть не розуміти складні питання математики або фізики, але вони занурюються в атмосферу наукової дискусії, або, як кажуть філософи, у «світ ідей Платона», що схоже на слухання складної музичної симфонії і що завжди залишає у свідомості свій слід.

А ще на верхньому поверсі головного корпусу є телескоп, у який можна розглядати зірки...

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Galaxy of Viktor Andrushchenko

Our galaxy, spirally turning, represents a powerful magnet that attracts new suns and new stars into its body, leaving dissolve, turning into cosmic dust, the old ones that have already exhausted their energy. In its motion the galaxy follows in the direction of evolution, creating a new beauty of the Universe.

It is said: "As in heaven, and on earth"... There are people-magnets who, by their activity, harmony with the tasks of evolution, build their terrestrial galaxies, attracting people-suns and people-stars. For the past 16 years Viktor Andrushchenko has been building his galaxy — the National Pedagogical Dragomanov University. He builds it in the difficult times of political confrontation and economic instability, revolutions, society's search for moral benchmarks, a new scientific and philosophical understanding of the world in conditions of unprecedented acceleration of life and growing amount of information.

When the synthesis is the main path of evolution, Viktor Andrushchenko also represents a kind of synthesis, combining a philosopher, a teacher, a scientist and a talented manager. This integrity (as a manifestation of culture) we feel throughout the university: here is a picture gallery of portraits from the Kiev princes to the heroes of modern Ukraine; one of the best musical faculties in Kyiv, an incredible choir; scientific library that using modern technologies and careful attitude to its archive; Center for interdisciplinary studies of complex systems with an active scientific seminars, where Ukrainian and foreign scientists prepare their reports. Students come to these workshops. They may not understand the complex issues of Mathematics or Physics, but they are immersed in an atmosphere of scientific discussion, or, as philosophers say, in the "world of Plato's ideas", which is similiar to listening to complex musical symphony and which always leaves its mark in the mind.

And on the upper floor of the main building of university there is a telescope in which stars can be seen...

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До 70-річного ювілею Віктора Петровича Андрущенка

Тетяна Урись[1]

Віктор Петрович Андрущенко — доктор філософських наук, професор, ректор Національного педагогічного університету імені М.П. Драгоманова, член-кореспондент Національної академії наук України, академік Національної академії педагогічних наук України, академік Академії наук Вищої школи України, перший віце-президент Спілки ректорів державних університетів України, президент Асоціації ректорів педагогічних університетів України та Європи, віце-президент Оксфордського клубу ректорів Європи, заслужений діяч науки і техніки України, лауреат Державних премій України в галузі освіти та в галузі науки і техніки, лауреат Міжнародної премії у сфері наукових досліджень «Ім'я в науці» Міжнародного Сократівського комітету (м. Оксфорд, Велика Британія), лауреат Першої премії АПН України та Премії імені Дмитра Чижевського НАН України, відомий науковець, філософ, педагог та організатор освіти й науки, почесний доктор 15 вітчизняних і зарубіжних університетів. Є ініціатором та співавтором Педагогічної Конституції Європи, прийнятий на другому засіданні Міжнародної асоціації ректорів педагогічних університетів Європі (Франкфурт-на-Майні, 2013).

Народився Віктор Петрович 1949 року в с. Совинка Конотопського району Сумської області в сім'ї вчителів. Закінчив Соснівську середню школу з золотою медаллю, продовжив навчання в Конотопському індустріальному технікумі, відслужив в армії, вступив до Київського національного університету імені Тараса Шевченка на філософський факультет, який закінчив з відзнакою. Протягом 1970–1995 років у своїй рідній alma mater пройшов шлях від студента, аспіранта, викладача, старшого викладача до доцента й професора. Захистив кандидатську (1979), а потім і докторську (1991) дисертації, отримав вчене звання доцента (1986), а згодом і професора (1992). П'ять років обіймав посаду заступника міністра освіти України та першого заступника міністра освіти України (1995–1999), опісля — директора Інституту вищої освіти АПН України (1999–2006). Новим етапом у його житті стала діяльність у Національному педагогічному університеті імені М. П. Драгоманова, який він очолив у 2003 році. Університет за період керівництва Віктора Петровича став поважним і добре знаним закладом вищої освіти на просторах не тільки України, але й Європи та світу, декларуючи значимість професії педагога, вчителя як провідника і вихователя майбутньої еліти держави.

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Віктор Андрущенко багато років очолював експертну раду Вищої атестаційної комісії України з філософії, політології та соціології. Під його керівництвом та за наукової консультації підготовлено і захищено 66 кандидатських і 53 докторських дисертацій. Він є членом редколегій журналів «Вища освіта в Україні», «Філософія освіти», «Директор школи, ліцею, гімназії», «Людина і політика», «Трибуна», «Гілея: історія, політологія, філософія», «Пам'ять століть», «Педагогіка та психологія. Науковий вісник АПН України», «Політичний менеджмент: політологія, соціологія, психологія, конфліктологія», «Рідна школа», «Соціальна психологія» та ін.

Наукові дослідження вченого концентруються навколо соціально-філософських проблем розвитку людини, філософії освіти, науки й культури, модернізації української освіти, стратегії розвитку вищої педагогічної освіти та підготовки вчителя в умовах глобалізації, становлення інформаційного суспільства, виховання студентської молоді та багато іншого.

Він фахівець у галузі філософії, політології, культурології, педагогіки вищої школи, автор понад 850 наукових праць, серед яких 75 індивідуальних і близько 40 колективних монографій, підручників, навчальних посібників для студентів закладів вищої освіти. Загальне визнання отримали книги «Історія соціальної філософії», «Роздуми про освіту», «Вступ до філософії. Великі філософи», «Організоване суспільство», «Сучасна соціальна філософія», «Культура. Ідеологія. Особистість» (у співав.), «Соціальна робота» (у співав.), «Світанок Європи: Проблема формування нового учителя для об'єднаної Європи XXI століття».

Як учений-філософ він обґрунтував модернову концепцію Людини, її підготовки до життя, навчання та виховання в умовах суспільних трансформацій. На особливу увагу заслуговує запропонована філософом концепція організованого суспільства — суспільства реабілітації гуманістичних цінностей, повернення до першооснов людського буття й культурного поступу, суспільства розумної взаємодії людей на основі їхньої творчої співпраці і внутрішньої, детермінованої обов'язком і совістю, поваги до закону, порядку і справедливості («Організоване суспільство»). Шлях до такого суспільства забезпечується, за логікою мислителя, через освіту, передусім педагогічну, яка потребує новітньої філософії. Власне, основи й принципи цієї філософії освіти загалом і педагогічної освіти зокрема розробляються В. Андрущенком у працях «Роздуми про освіту: філософія та методологія» (2004), «Світанок Європи: проблема формування нового вчителя для об'єднаної Європи XXI століття» (2011), «Освітня політика» (2012, у співав.) та ін., крім того, її ідеї були покладені в основу «Національної доктрини розвитку освіти України у XXI столітті».

Центром цієї новітньої філософії, згідно з В. Андрущенком, є людина як самоцінність у всій повноті свого творчого ставлення до життя й такій же повноті можливостей для власної самореалізації. Вона «має базуватися на загальнолюдських цінностях у їх органічному поєднанні з національними пріоритетами і повинна розгортатись, як «благоговіння перед життям» (А. Швейцер), прагнення «вічного миру» (І. Кант), введення людства в царство вічного спокою й свободи — ноосферну фазу його цивілізаційного поступу (В. Вернадський, П. Тейяр де Шарден)» [Андрущенко В.

Педагогічна освіта: історико-філософська рефлексія для майбутнього розвитку. *Філософія освіти.* 2007. № 1(6). С. 6].

Віктор Петрович нагороджений орденами князя Ярослава Мудрого V ступеня, «За заслуги» I, II і III ступенів, Почесною грамотою Верховної Ради України, нагрудними знаками «За наукові досягнення» та «Відмінник освіти України», почесними грамотами АПН України, Міністерства освіти і науки України, Міністерства внутрішніх справ України, Державного комітету у справах молоді та туризму, Всеукраїнського товариства «Просвіта» імені Тараса Шевченка, Товариства «Знання» України, орденами і медалями багатьох інших організацій.

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To 70 years anniversary of Viktor Andrushchenko

Tetiana Urys[1]

Viktor Andrushchenko is a Doctor of Philosophy, Professor, Rector of the National Pedagogical Dragomanov University, Corresponding Member of the National Academy of Sciences of Ukraine, Member (Academician) of the National Academy of Pedagogical Sciences of Ukraine, the First Vice-President of the Union of Rectors of the State Universities of Ukraine, President of the Association of Rectors of the Pedagogical Universities of Ukraine and Europe, a Vice-President of the Oxford European Rectors' Club, Honored Worker of Science and Technology of Ukraine, Laureate of the State Prizes of Ukraine in the field of education and in the field of science and technology science and technology, Laureate of the International Award "The Name in Science" in the field of scientific researches from the International Socrates Committee (Oxford, UK), Laureate of The Fist Diploma of the National Academy of Pedagogical Sciences of Ukraine of Dmitry Chizhevsky Award of National Academy of Sciences of Ukraine, famous scientist, philosopher, teacher and organizer of education and science, Doctor Honoris Causa of 15 Ukrainian and foreign universities. He is an initiator and co-author of the Pedagogical Constitution of Europe, adopted by the Second Congress of the International Association of Rectors of Pedagogical Universities in Europe (Frankfurt-on-Main, 2013).

He was born on 1 January 1949 in the village Sovynka, Konotop district of Sumy region, Ukraine, in the family of teachers. He graduated from Sosnivska secondary school with a gold medal, continued his studies at the Konotop Industrial Technical School, served in the army, entered the Taras Shevchenko National University of Kyiv on the Faculty of Philosophy that graduated with honors. During 1970–1995 in his native alma mater went from student, postgraduate, lecturer, senior lecturer to assistant professor and professor. He defended a Ph.D. (1979), then a doctor's dissertation (1991), received an academic rank Docent (1986) and Professor (1992). For five years he served as Deputy Minister of Education of Ukraine and First Deputy Minister of Education of Ukraine (1995–1999), later — Director of the Institute of Higher Education of the Academy of Pedagogical Sciences of Ukraine (1999–2006). A new stage in his life was the activity at the National Pedagogical Dragomanov University, which he headed in 2003. During the period of V. Andrushchenko's leadership the university became a reputable and well-known institution of higher education in the spaces not only of Ukraine, but also of Europe and the world, declaring

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the significance of the profession of teacher as a leader and educator of the future elite of the state.

V. Andrushchenko has been the head of the expert council of the Higher Attestation Commission of Ukraine for Philosophy, Political Science and Sociology for many years. Under his guidance and supervision 66 candidate and 53 doctoral dissertations were prepared and defended. He is an editor-in-chief or member of the editorial boards of the journals "Higher Education of Ukraine", "Philosophy of Education", "Director of School, Lyceum, Gymnasium", "Human and Politics", "Tribune", "Gilea: History, Political Science, Philosophy", "Memory of the Centuries", "Pedagogy and Psychology. Scientific Bulletin of the Academy of Pedagogical Sciences of Ukraine", "Political Management: Political Science, Sociology, Psychology, Conflictology", "Native School", "Social Psychology", etc.

His research concentrates on the socio-philosophical problems of human development, the philosophy of education, science and culture, the modernization of Ukrainian education, strategies for the development of higher pedagogical education and teacher training in the conditions of globalization, the formation of an information society, the education of student youth, and much more.

Scientist is a specialist in the field of Philosophy, Political Science, Cultural Studies, the Pedagogy of Higher Education. He is the author of more than 850 scientific works, among them 75 individual and about 40 collective monographs, textbooks, manuals for students of higher educational institutions. The general recognition was given by the books "The History of Social Philosophy", "Reflections on Education," "Introduction to Philosophy. Great Philosophers", "Organized Society", "Modern Social Philosophy", "Culture. Ideology. Personality" (in co-authorship), "Social Work" (in co-authorship), "The Dawn of Europe: The Problem of Creating a New Teacher for a United Europe of the 21st Century".

As a scholar-philosopher he substantiated the modern concept of human, his preparation for life, learning and upbringing in the conditions of social transformations. Particular attention deserves the concept of organized society proposed by the philosopher. It is a society for the rehabilitation of humanistic values, a return to the first principle of human existence and cultural progress, as well as the intelligent interaction of people on the basis of their creative cooperation and internal, determined responsibility and conscience, respect for law, order and justice ("Organized society"). The path to such a society is ensured, according to the logic of the thinker, through education, first of all pedagogical, which needs a new philosophy. In fact, the foundations and principles of this philosophy of education in general and pedagogical education in particular are developed by V. Andrushchenko in the works "Reflections on Education: Philosophy and Methodology" (2004), "The Dawn of Europe: The Problem of Creating a New Teacher for a United Europe of the 21st Century" (2011), "Educational Policy" (2012, in co-authorship), etc., in addition, its ideas became the basis of the "National Doctrine of the Development of Ukraine's Education in the 21st Century".

According to his ideas, the center of this new philosophy is a human as an intrinsic value in all his full creative attitude towards life and such full

completeness of possibilities for its own self-realization. It "must be based on universal values in their organic combination with national priorities and must unfold as "reverence for life" (A. Schweitzer), the desire for "eternal peace" (I. Kant), the introduction of humanity into the kingdom of eternal rest and freedom — the noospheric phase of its civilization advancement (V. Vernadsky, P. Teilhard de Chardin)" [Andrushchenko V. Pedagogical Education: Historical and Philosophical Reflection for Future Development. *Philosophy of Education.* 2007. No. 1 (6). P. 6].

Viktor Andrushchenko was awarded with the Order of the Prince Yaroslav the Wise of the V degree, the "Order of Merit" of I, II and III degrees, the Diploma of the Verkhovna Rada of Ukraine, award signs "For Scientific Achievements" and "Excellence in Education of Ukraine", Diplomas of the Academy of Pedagogical Sciences of Ukraine, Ministry of Education and Science of Ukraine, the Ministry of Internal Affairs of Ukraine, the State Committee for Youth and Tourism, the All-Ukrainian Taras Shevchenko Society "Prosvita", "Znannya" Society of Ukraine, awards and medals of many other organizations.

Юрій Кондратьєв
Yuri Kondtratiev

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Математик Юрій Кондратьєв

Юрій Кондратьєв народився 23 жовтня 1953 року в Києві, закінчив київську фізико-математичну школу №145, у 1970 році з відзнакою закінчив Київський державний університет ім. Т. Г. Шевченка.

У 33 роки Ю. Кондратьєв став доктором фізико-математичних наук. У 1990 році отримав стипендію Фонду Олександра Гумбольдта (Німеччина). З того часу суміщає роботу за кордоном із науковою і педагогічною діяльністю в Україні.

У 1996 році Ю. Кондратьєв став лауреатом Державної премії України у галузі науки та техніки.

У 2000 році отримав професорську позицію в Німеччині.

У 2006 році очолив кафедру прикладної математики Редінгського університету (Англія).

У 2008 році прийняв посаду повного професора Білефельдського університету (Німеччина).

Юрій Кондратьєв є організатором і учасником багатьох міжнародних проектів і конференцій; читав курси лекцій в університетах Лаквіли та Верони (Італія), Лісабона та Мадейри (Португалія), неодноразово робив доповіді в університетах Оксфорда та Кембриджа (Англія), Корнельському, Радгерському, Браунському та інших університетах США,Тунісу, Китаю, Японії.

Науковими інтересами професора Кондратьєва є математичний аналіз, математична фізика, теорія ймовірності, нескінченовимірний аналіз, дослідження складних динамічних систем, стохастичний аналіз, просторова комбінаторика.

На сьогодні Юрій Кондратьєв — один із найбільш цитованих українських математиків: 2140 цитувань, 429 авторів, 235 цитованих публікацій (за даними MathSciNet Американського Математичного Товариства).

Юрій Кондратьєв є також шеф-редактором одного з важливіших українських математичних журналів «Methods of Functional Analysis and Topology».

У другій половині XX століття фізики-теоретики «йшли в математику»: намагалися математичними методами доводити або спростовувати фізичні гіпотези, пояснювати та аналізувати експериментальні дані, робити обґрунтовані прогнози. Значно рідше «чисті математики» йшли у фізику

та інші природничі науки. За цим, в певній мірі, стояло питання філософії, — питання співвідношення математики і дійсності.

Зацікавленість математичною фізикою у Кондратьєва сформувалася під впливом співробітництва з видатними школами таких математиків як Р.Л. Добрушин, Р.А. Мінлос, Я.Г. Синай, А.В. Скороход. Особливим було спілкування з І.М. Гельфандом. Ю.Кондратьєв уважає цих математиків своїми вчителями.

Здібність заглиблюватись в суть фізичних явищ відіграла свою роль при знайомстві Кондратьєва з роботами українського інженера — фізика, наукового керівника лабораторії електродинамічних досліджень «Протон 21» С.В. Адаменка. Особисте знайомство з С.В.Адаменком та його працями в галузі ядерного синтезу відбулося на початку 2003 року. Саме в той час ряд академіків Відділення фізики НАНУ сприймали дослідження С.В. Адаменка як спекуляцію, оскільки ці дослідження вказували на наявність у природі явищ, неможливих із позицій загальноприйнятої фізики. Але Кондратьєв інтуїтивно відчув, що дані дослідження є дуже важливими для науки. Він повідомив про результати експериментів С.В. Адаменко фізикам з університету Барі (Італія), і Франко Селлері, професор цього університету, посприяв виданню монографії з результатами досліджень українського фізика в престижному видавництві «Springer». У 2007 році у Берліні вийшла книга «Controlled Nucleosynthesis» (S.V. Adamenko, F. Selleri, A van der Merwe Editors). Надалі Кондратьєв продовжував брати активну участь в обговоренні ряду питань, які стосувалися процесів самоорганізації при ядерному синтезі.

Досліджуючи складні динамічні системи у різних галузях, Ю. Кондратьєв висловив думку, що, відкривши закономірності, застосовні до широкого кола різних складних систем, буде можливо пізнати фундаментальні закони світобудови. Звідси народжується необхідність міждисциплінарних досліджень складних систем.

У 2009 році професор Кондратьєв спільно з британським професором-екологом Ричардом Лоу із університету Йорк організував у Центрі ICMS (Единбург, Шотландія) міжнародний воркшоп на тему «Stochastic Population Dynamics and Applications in Spatial Ecology» («Стохастична динаміка популяції та застосування в просторовій екології»). Одночасно Кондратьєв почав організовувати з колегами із Англії, Фінляндії та США науковий семестр по стохастичній динаміці в Центрі міждисциплінарних досліджень (ZIF) на базі університету Біелефельд. Гаслом цього наукового заходу професор Кондратьєв запропонував взяти вислів І. Гельфанда: «Мова математики допомагає організовувати багато речей».

Того ж року Ю. Кондратьєв запропонував організувати в Україні Центр міждисциплінарних досліджень складних систем. Ідею було підтримано ректором НПУ ім. М.П. Драгоманова В.П. Андрущенком і проректором з наукової роботи Г.І. Волинкою. У 2010 році такий Центр було організовано, і очолив його професор Ю. Кондратьєв. У 2012 році у Центрі при НПУ ім. М.П. Драгоманова було засновано міжнародний журнал «Міждисциплінарні дослідження складних систем».

За сім років роботи у журналі публікувалися праці видатних європейських учених у галузі математики, фізики, космології, питань освіти, філософії та ін. Із позиції різних наук розглядалися актуальні наукові про-

блеми сучасності. Наочним прикладом міждисциплінарних досліджень може слугувати піонерська робота «Stochastic models of tumour development and related mesoscopic equations » (№7, 2015р.) шести авторів із університетів Великобританії, Німеччини, Польщі та України. Ця праця об'єднує в собі мотивації із галузі біології та медицини з математичними методами теорії складних систем. Саме для таких робіт журнал є форумом, що об'єднує дослідників із різних галузей науки.

З часом особливу зацікавленість у Ю.Кондратьєва викликали питання застосування математики в біології, побудови математичних моделей в біології. Професор Кондратьєв познайомився з науковими працями видатного вченого XX ст., першого президента Української академії наук В.І. Вернадського. Перш за все, В.І. Вернадський відомий як автор робіт про Біосферу і перехід її в Ноосферу; менш відомо, що Вернадський увів у біологію число, що дало можливість говорити про процеси в біології кількісно. Відкриття законів дисипації змусило В.І. Вернадського звернутися до математиків із питанням про можливості математичного опису «лівого» і «правого». Окрім того, Вернадський увів у біологію поняття біологічного простору і біологічного часу. Отже, Ю. Кондратьєв, займаючись математичними моделями в біології, дійшов до висновку, що у них доцільно використовувати не абсолютний час Ньютона, а біологічний час Вернадського.

Французький математик А. Гротендік у своїй книзі «Урожаї і посіви» писав, що математику можна порівняти з містом, у якому більшість математиків люблять «жити в уже зведених будинках». Вони роблять там ремонт, купують меблі, пересувають їх. Значно рідше математики створюють свій простір і будують новий дім.

Математик Ю. Кондратьєв будує свій дім.

У математиці є поняття «простір Кондратьєва». Для колег і друзів, близьких ученому, цей термін має більш загальне значення — значення всіх його ідей, математичних інтересів, його наукового світобачення вцілому.

До ювілею вченому було подаровано присвячене йому есе «Моделі та Аделі», оскільки останнім часом він активно займається дослідженнями у царині p-адичних чисел і аделей. Він поділяє думку Ю.І. Маніна про те, що «на фундаментальном уровне наш мир не является ни вещественным, ни p-адическим: он адельный... Мы обычно проецируем адельную картину в вещественную сторону. С тем же успехом мы могли бы духовно проецировать ее в неархимедову сторону и вычислять наиболее важные вещи арифметически... «Вещественная» и «арифметическая» картины мира находяться в отношении дополнительности, напоминающем отношение между сопряженными наблюдаемыми в квантовой механике». Юрій Кондратьєв гадає, що адельну картину світу можна уявити у вигляді метелика. Адже саме метеликом зачасту зображають квантову спряженість, квантову заплутаність «лівого» і «правого». На шляху від Біосфери до Ноосфери адельний світ, можливо, буде відігравати щодалі значнішу роль.

Міждисциплінарність виявляєтьсяі у всій особистості Ю. Кондратьєва: він захоплюється поезією, питаннями історії та філософії, його хвилюють проблеми сучасної освіти. Але перш за все — це вчений, математик Юрій Григорович Кондратьєв.

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Mathematician Yuri Kondtratiev

Today, Yuri Kondratiev is one of the most highly cited Ukrainian mathematicians.

> Born on 23 October, 1953, in Kyiv, he finished the Kyiv School of Physics and Mathematics No.145 and graduated cum laude from the Taras Shevchenko National University of Kyiv.
>
> Aged 33, Kondratiev became a doctor of physical and mathematical sciences.
>
> In 1990, he received the Alexander von Humboldt Foundation fellowship, Germany. Ever since, he combined his work abroad with his scientific activities in Ukraine.
>
> In 1996, Yuri Kondratiev won the State Prize of Ukraine for science and technology.
>
> In 2000, he obtained a professorship in Germany.
>
> In 2006, he headed the Department of Applied Mathematics at the University of Reading (the UK).
>
> In 2008, he was appointed Full Professor at the Bielefeld University (Germany).

Yuri Kondratiev, an organiser and participant of numerous international projects and conferences, was often invited to deliver lectures at universities in Europe, USA, China, Japan.

Professor Kondratiev's interests span a wide range of scientific pursuits covering mathematical analysis, mathematical physics, probability theory, infinite-dimensional analysis, studies of complex dynamic systems, stochastic analysis, and spatial combinatorics.

In the second half of the 20th century, theoretical physicists "would engage themselves in mathematics". That was understandable: by using mathematical methods, they wanted to prove or disprove physical hypotheses, explain and analyse experimental data, and produce reasonable forecasts. More rarely "pure mathematicians" would become converts to physics and other natural sciences. To one extent or another, a question of philosophy lay behind it — the relationship between mathematics and reality.

Kondratiev's interest in mathematical physics was largely shaped owing to his collaboration with renowned schools of mathematicians R.L. Dobrushin, R.A. Minlos, Ya. G. Sinai and A.V. Skorokhod. Kondratiev also benefited from his association with I. M. Gelfand. He always refers to these mathematicians as his teachers.

His ability to grasp the essence of physical phenomena played its role as Kondratiev got familiar with works by S.V. Adamenko, a Ukrainian engineer-physicist, supervisor of the scientific-research Electrodynamics Laboratory "Proton 21". In early 2003, he got personally acquainted with S.V. Adamenko and his works dedicated to nuclear fusion. At that time, a number of academicians representing the Physics Department at Ukraine's National Academy of Sciences regarded Adamenko's research as speculation, since it was indicative of some phenomena in nature that were considered impossible from the standpoint of classical physics. However, Kondratiev's scientific intuition suggested that those studies were very important for science.

He shared the research results with physicists at the University of Bari (Italy), and its professor F. Selleri assisted in publishing a monograph on the Ukrainian physicist's findings with Springer, a prestigious publishing house. In 2007, "Controlled Nucleosynthesis" (S.V. Adamenko, F. Selleri, A van der Merwe Editors) was released in Berlin. In the years that followed, Kondratiev took an active part in discussing issues related to self-organisation processes that occur during a nuclear fusion.

While studying complex dynamic systems in various fields, Kondratiev assumed, when scientists could discover laws applicable to a wide range of different complex systems, it would be possible to learn fundamental laws of the world order. Hence the need for interdisciplinary research on complex systems.

In 2009, Yuri Kondratiev and his colleagues from U.K. organized workshop "Stohastic Population Dynamics and Application in Spatial Ecology" (ICMS, Edinburg). In parallel, Kondratiev began to organize the scientific semester "Stochastic Dynamics. Mathematical Theory and Applications" in the Center of interdisciplinary research ZIF, University Bielefeld. The motto of this semester, he proposed to take I. Gelfand's quote: "Mathematical language helps to organize a lot of things".

In 2009, Yuri Kondratiev also came up with a proposal to set up a Centre for interdisciplinary studies of complex systems in Ukraine. V.P. Andrushchenko, Rector of the Dragomanov National Pedagogical University, and G.I. Volynka, Vice-Rector for Science, enthusiastically supported the idea. In 2010, the Centre was founded and Professor Kondratiev became its director, with a subsequent launch of the magazine "Interdisciplinary Studies of Complex Systems" in 2012.

Famous European scientists' works in mathematics, physics, cosmology, education, philosophy etc. appeared on pages of the magazine in the past seven years. Important scientific issues of our time were examined from the standpoint of various sciences. A potent example of interdisciplinary research is "Stochastik Models of Tumour Development and Related Mesoscopic Equations (Issue No. 7, 2015) — a pioneering work by six authors from universities in the UK, Germany, Poland and Ukraine. This work combines motivations from biology and medicine spheres with mathematical methods of the complex systems theory. For this kind of work, the magazine operates as a forum that unities researchers coming from various branches of science.

Over time, Yuri Kondratiev expressed a keen interest in the application of mathematics to biology and the construction of mathematical models in

biology and ecology. He got acquainted with scientific works by V.I. Vernadsky, an outstanding scientist of the twentieth century, the first President of the Ukrainian Academy of Sciences. Above all, Vernadsky is widely known as the author of works on the Biosphere and its transition to the No?sphere. It is a little-known fact though that Vernadsky introduced a number into biology, which made it possible to speak about biology processes in terms of quantity.

Discovery of the laws of dissipation made Vernadsky address mathematicians with a question about a possible mathematical way to describe the "left" and "right". In addition, Vernadsky introduced the concepts of biological space and biological time into biology. When studying mathematical models in biology, Kondratiev arrived at a conclusion that these models should exploit not Newton's absolute time, but Vernadsky's biological time.

In his book "Harvests and Seeds", French mathematician Grothendieck writes that mathematics can be compared to a city and most mathematicians tend to "live in houses that have already been built". They make repairs, purchase furniture and rearrange interior. Less frequently mathematicians create their own space and build a new house.

Mathematician Yuri Kondratiev does erect his own house.

There is a term in mathematics — "Kondratiev space". To some of the scientist's colleagues and close friends, the term has a more general meaning — it symbolises all his ideas, mathematical interests, scientific paradigm as a whole.

On the anniversary, the scientist was presented with the essay "Models and Adeles" dedicated to him — in recent years, Kondratiev has been actively exploring p-Adic numbers and Adeles. He shares the opinion of Yu. I. Manin who says that "at the fundamental level, our world is neither real nor p-adic: it is adelic... We usually project an adelic image into the material side. We might as well spiritually project its non-Archimedean side and arithmetically calculate the most important things...

"Material" and "arithmetic" pictures of the world constitute a relation of complementarity, resembling the relation between the conjugate observables in quantum mechanics." Kondratiev says that the adelic picture of the world can be represented as a butterfly. But it is the butterfly that most often depicts the quantum conjugacy, the quantum entanglement of the "left" and the "right". With the Biosphere transiting to the Noösphere, the adelic world will probably play an ever-increasing role.

Interdisciplinarity is apparent in Yuri Kondratiev's entire personality — he is interested in poetry, questions of history and philosophy, he is concerned about today's education problems. And the scientist, mathematician — Yuri Kondratiev — stands behind all this.

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Сержіо Альбеверіо

Сержіо Анжело Альбеверіо — швейцарський математик, що працює в багатьох галузях математичної науки. Широко відомі його роботи з теорії ймовірностей, математичного аналізу, зокрема незкінченновимірного і стохастичного (випадкового) аналізу, математичної фізики. Він також має роботи з алгебри, геометрії і теорії чисел.

Сержіо Альбеверіо народився в Лугано (Швейцарія) 17 січня 1939 року.

Закінчив Швейцарський Федеральний Технічний Інститут у Цюріху (керівники дипломної роботи Маркус Фирц і Давід Рюель), захистив дисертацію під керівництвом Маркуса Фирца і Реса Йоста. Потім проводив дослідницькі роботи в університетах Прінстона (США), Осло (Норвегія), Марселя II (Франція).

З 1977 року — професор математики в Німеччині:

1977–79 рр. — університет Білефельд.

1979–97 рр. — завідувач кафедри теорії ймовірностей та математичної фізики університету Бохум.

З 1997 року — завідувач кафедри теорії ймовірностей та математичної статистики університету Бонн.

Працював як запрошений професор у багатьох університетах і наукових центрах Європи, Китаю, Японії, Мексики, Росії та США.

Є автором та співавтором 11 наукових монографій.

Сержіо Альбеверіо — лауреат Премії Макса Планка, почесний доктор університетів Осло і Стокгольма.

Коло інтересів Сержіо Альбеверіо виходить за межі математичної науки, він цікавиться питаннями економіки, інженерними науками, математичними моделями урбаністики та соціальними науками, є автором багатьох філософських есе.

Сержіо Альбеверіо декілька разів відвідував Київ і консультував роботи, надруковані в журналі «Міждисциплінарні дослідження складних систем».

Сержіо Альбеверіо з дружиною Сольвейг на врученні Диплома Почесного доктора Стокгольмського університету, Стокгольм, 31 жовтня 2018 року

Sergio Albeverio with his wife, Solveig, at the Ceremony for awarding the title of Doctor Honoris Causa of Stockholm University, Stockholm, 31 October 2018

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Sergio Albeverio

Sergio Albeverio is a Swiss mathematician and mathematical physicist working in numerous fields of mathematics and its applications. In particular he is known for his work in probability theory, analysis (including infinite dimensional, non-standart, and stochastic analysis), mathematical physics, and in areas algebra, geometry, number theory, as well as in applications, from natural to social-economic sciences.

Sergio Albeverio born 17 January 1939 in Lugano, Switzerland.

Career:

Study of mathematics and physics at the ETH Zurich with a Diploma Thesis (1962) under the direction of Markus Fierz and David Ruelle, and a Ph.D. Thesis (1966) under the direction of Res Jost and Markus Fierz.

Visiting lecturer at Imperial College (1967–68, R.F. Streater), invitation by Irving Segal as co-worker MIT (1968–69), Research Fellowship at Princeton University, University of Aix-Marseille II

Since 1977 permanent professorships in Germany:

1977–79 University of Bielefeld

1979–97 Titular of Chair for Probability and Mathematical Physics, Ruhr-University Bochum.

Since 1997: Titular of Chair for Probability and Mathematics Statistics, University of Bonn (Emeritus since 2009)

Awards and Prizes:

Max-Planck Award in mathematics 1992

Doctor honoris causa of University of Oslo 2002

Prize for interdisciplinary Project, University of Bonn 2003

Doctor honoris causa of University of Stokholm 2018

Longer research and invited professorship at many universities and research centers in Europe, China, Japan, Mexico, USSR/Russia, USA.

The author and of 11 monographs.

The author of many philosophical and cultural issues.

Sergio Albeverio visited Ukraine. He is the member of the Editorial Board of the journal “Interdisciplinary studies of complex systems”.

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Людвиг Штрайт

Людвіг Пауль Арі Еверт Штрайт — німецький і австрійський фізик-теоретик, один з засновників White Noise Analysis.

Як фізик-теоретик Людвіг Штрайт працює в галузі квантової теорії поля, квантової механіки, ядерної фізики і фізики полімерів. У математиці сфера інтересів вченого сконценрована на питаннях нескінченновимірного аналізу і теорії стохастичних (випадкових) процесів.

Людвіг Штрайт народився в Лейпцігу (Німеччина) 26 липня 1938 року.

У 1957 році почав навчання на факультеті природничих наук університету Геттінген.

У 1960 році продовжив навчання в університеті Грац, де вивчав теоретичну фізику, а також математику, філософію і психологію.

У 1963 році захистив дисертацію в університеті Грац під керівництвом Вольфхарда Циммермана і Пауля Урбана. Далі працював як фізик-теоретик в університеті Сіракуз (США) і «Bell telephone» лабораторії в Нью-Джерсі (США).

З 1972 року Людвіг Штрайт — професор фізики університету Білефельд.

Є почесним доктором університету Грац.

Як запрошений професор працював в Тунісі, Італії, Китаї, Японії, на Тайвані, в Бурунді та на Філіппінах. Особливо потрібно відзначити внесок професора Штрайта в розвиток математичних наук в Португалії, організації їм «Центру Математики» на Мадейрі. Сьогодні він є членом Лісабонської Академії Наук.

Людвіг Штрайт — визнаний знавець класичної опери, цікавиться питаннями філософії та системою європейської освіти. Він неодноразово відвідував Україну, брав участь в міжнародних конференціях в Києві та в Чернівцях.

Професор Штрайт бере активну участь в роботі журналу «Міждисциплінарні дослідження складних систем». Тут надруковані його роботи: «Complexity, Acceleration, Globalization,— A Challenge for Demorracy» (журнал №7, 2015 г.) і «Higher Education To-Day — A Billion Euro Misunderstanding » (журнал №8, 2016).

Людвіг Штрайт (у центрі), Юрій Кондратьєв (ліворуч)
та Сержіо Альбеверіо (праворуч). Київ, 2003

Ludvig Streit (in the middle), Yurij Kondratiev (left),
Sergio Albeverio (right) in Kiev

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Ludvig Streit

Ludvig Paul Ary Evert Streit (born 26 Juli 1938 in Leipzig, Germany) is a German and Austrian theoretical and mathematical physicist working in numerous filds of physics (quantumfildtheory, quantummechanics, nuclear physics, polimer physics) and mathematics (infinite dimensional analysis, theory of stochastic processes), is one of the founders of the White Noise Analysis.

Career:

Study of physics and mathematics at Gottingen University (1957–1960). Since 1960 study of physics and additional disciplines (mathematics, philosophy, psychology) at Graz University with a Diploma Thesis and a Ph. D. Thesis (1963) under the direction of Wolfhard Zimmermann and Paul Urban.

Research Fellowship, Associate Professor at Syracuse University, USA.

Research Fellowship at Bell Telephone Laborator in Murray Hills, New Jersey.

Since 1972 permanent professorships in Germany.

Doctor honoris causa of the Graz University (1973).

Longer research and invited professorship at many universities and research centers in Europe, Tunisia, Taiwan, China, Japan, Burundi, Philippines.

Streit's "engagement" for science in Portugal deserves a special mention. Need to mention his

Ludwig Streit is a big fan of classical opera, he is interesting in the philosophy and involved in discussions about problems of the European education system.

He visited Ukraine several times participating in conferences in Kyiv and Chernivtsy.

Ludwig Streit actively collaborates with the journal "Interdisciplinary studies of complex systems" where were published his papers:

"Complexity, Acceleration, Globalization — A Challenge for Democracy" (No 7, 2015);

"Higher Education To-Day — A Billion Euro Misunderstanding" (No 8, 2016).

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Володимир Євтух

Володимир Борисович Євтух — відомий український вчений у сфері дослідження соціальних процесів і соціальних феноменів з спеціальним акцентом на етнічних явищах; професор і декан у Національному педагогічному університеті імені М.П. Драгоманова (Київ, Україна).

В.Б. Євтух народився у невеликому містечку Зарічне Рівненської області, де він у 1966 році закінчив місцеву школу і у тому ж році вступив до Київського державного університету імені Т.Г. Шевченка (нині Київський національний університет імені Тараса Шевченка), який закінчив 1971 року. Там він вивчав мови і філософію. Науковий ступінь кандидата історичних наук Володимир Євтух здобув в Інституті історії Академії наук України (1975 р.). Тема — «Асиміляційні процеси та їх вплив на культуру українських етнічних груп США і Канади (1945–1970 рр.)». Його докторська дисертація була присвячена аналізу концепцій етносоціального розвитку США і Канади у різні історичні періоди.

Наукові й дослідницькі активності професора Володимира Євтуха посправжньому інтенсивні. З 1971 по 2001 роки він працював у наукових установах Академії наук України (нині Національна академія наук України): Інститут історії (нині Інститут історії України), Інститут соціально-економічних проблем зарубіжних країн (нині Інститут всесвітньої історії), Інститут соціології. Тут він обіймав посади наукового співробітника, завідуючого відділами, директора наукового центру. Теорія етнічності, діаспора, націєтворення, етнічні явища стали головними темами у його дослідженнях. Список його праць сягає майже 500 одиниць — монографії, підручники, статті тощо, значна частина яких опубліковані у багатьох країнах світу (Австрія, Білорусь, Латвія, Німеччина, Польща, Росія, США, Угорщина, Україна, Хорватія). Його праці інтенсивно цитують українські і зарубіжні дослідники. За даними Каталогу on-line бібліотечного комп'ютерного центру OCLC World Cat Identities 58 праць професора, опубліковані чотирма мовами, можна віднайти у 312 бібліотеках світу. Володимир Євтух викладав етносоціологію та працював деканом у Київському національному університеті імені Тараса Шевченка (2001–2007 рр.).

Професор Володимир Євтух у 1992 році був обраний членом-кореспондентом НАН України, а у 1998 році йому було присвоєне звання Заслуженого діяча науки і техніки України. Він нагороджений низкою державних нагород, зокрема орденом «За заслуги» III та II ступеню, і відзнак громадських організацій.

Професор Євтух бере активну участь у різноманітних наукових активностях — конференціях, семінарах, дискусіях — як у вітчизняних, так і

у зарубіжних. Він як професор на запрошення читав лекції в університетах Німеччини (Бохум, Гейдельберг, Коледж «Схід-Захід», Мюнхен, Регенсбург, Франкфурт-на-Майні), Латвії (Рига), Польщі (Варшава, Краків), США (Берклі, Міннесота, Станфорд). Його наукові здобутки визнані вітчизняними й зарубіжними ученими; він був очільником Республіканської асоціації українознавців (1993–1995 рр.), членом дорадчого комітету Європейського міграційного форуму (Бамберг, Німеччина, 1992–1998 рр.), Відбіркового комітету Фонду МакАртурів (США, 1994–1996 рр.).

Професор Євтух був обраний *Doctor Honoris Causa* Харківського національного університету імені В.Н. Каразіна, Латвійського університету (Рига, Латвія), Східно-Європейського університету імені Лесі Українки (Луцьк); він є членом редколегії журналів «Politeja. Jagiellonian Cultural Studies» (Польща), of Scientific papers «Pedagogija un skolotäju izglitiba» («Pedagogy and Teacher Education», Латвія) та низки українських наукових журналів.

Володимир Євтух відомий політичний і громадський діяч: він був Міністром Головою комітету у справах національностей та міграції (1995–1997 рр.), Надзвичайним і Повноважним Послом України в Італії та за сумісництвом на Мальті, першим послом України у Республіці Сан-Марино (1997–1999 рр.); головою Ради представників громадських організацій при Президентові України (2000–2002 рр.); експертом Механізму людського виміру ОБСЄ (2007–2013 рр.); є головою Експертної ради з питань державної етнополітики при Міністерстві культури України. В. Євтух брав участь в офіційних заходах ООН, Ради Європи, ОБСЄ. Він є Почесним громадянином штату Міськонес та міста Посадас (Аргентина, 1997 р.); є учасником ліквідації наслідків аварії на Чорнобильській атомній електростанції (1986 р.).

Професор Володимир Євтух володіє українською, англійською, грецькою, італійською, німецькою, російською, французькою мовами.

Володимир Євтух
Volodymyr Yevtukh

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Volodymyr Yevtukh

Volodymyr Yevtukh is well known Ukrainian scientist in the sphere of researching the social processes and social phenomena with the special accent on the ethnic issues; professor and the dean of National Pedagogical Dragomanov University (Kyiv, Ukraine).

Born 14 July 1948 in a small town Zarichne (Rivne region) he finished the local school 1966 and entered this year Kyiv State University named after T.G. Shevchenko (now Kyiv National Taras Shevchenko University) and graduated from it 1971. He studied languages and philosophy there. His Ph.D. Volodymyr Yevtukh got at the Institute of History of Ukraine's Academy of Sciences (1975) for thesis "Assimilation processes and their influence upon the culture of Ukrainian ethnic groups in the USA and Canada (1945–1970)". His dissertation for the title "Doctor of Sciences" (1989) refers to the analysis of concepts of ethno-social development of the USA and Canada in different historical periods.

The scientific and research activities of professor Volodymyr Yevtukh is really intensive. From 1971 to 2001 he worked at the institutions of Ukraine's Academy of Sciences (now National Academy of Sciences of Ukraine): Institute of History (now Institute of History of Ukraine), Institute for Social and Economic Problems of Foreign Countries (now Institute of World History), Institute of Sociology. At these institutions he was working as a researcher, head of departments, head of the scientific centre. Theory of ethnicity, diaspora, nation-building, ethnic issues became the key topics of his research. The list of his works numbers about 500 items — books, text-books, articles etc. published in a number of countries (Austria, Byelorussia, Croatia, Germany, Hungary, Latvia, Poland, Russia, Ukraine, USA). He is active cited by Ukrainian and foreign researchers. According to OCLC WORLD CAT Identities his 58 works published in four languages can be found in 312 libraries of the world. He taught ethnosociology and was the dean at the Kyiv National Taras Sevchenko University (2001- 2007).

He was elected a Correspondent Member of the National Academy of Sciences of Ukraine (1992) and he was awarded the title "Honored Worker of Science and Technology of Ukraine" (1998) and a number state decorations and decorations of public organizations too.

Professor Volodymyr Yevtukh takes active part in different scientific activities — conferences, seminars, discussions — home and abroad. As a visiting professor he delivered lectures at universities in Germany (Bochum, Frankfurt-am-Main, Heidelberg, Munich, Regensburg, Ost-West College), in Latvia (Riga), Poland (Krakow, Warsaw), USA (Berkeley, Minnesota, Stanford). His scientific

merits are recognized by scholars in different countries; he was the president of Republic Association of Ukrainian Studies (1993–1995), the member of the advisory board of European Migration Forum (Bamberg, Germany, 1992–1998), of the Selective Committee of the MacArthur Foundation (USA, 1994–1996).

Professor Yevtukh was awarded the title *Doctor Honoris Causa* of Karasin Kharkiv National University (Kharkiv, Ukraine), University of Latvia (Riga, Latvia), East-European National Lesya Ukrainka University (Lutsk, Ukraine) and the member of editorial boards of the Journal "Politeja. Jagiellonian Cultural Studies" (Poland), of Scientific papers "Pedagogija un skolotäju izglitiba" ("Pedagogy and Teacher Education", Latvia), of a number of Ukrainians scientific journals.

Volodymyr Yevtukh is known as a politician and a public figure: he was the Minister for Nationality and Migration in Ukrainian Government (1995–1997), the Extraordinary and Plenipotentiary Ambassador of Ukraine to Italy, to Malta and the first Ambassador of Ukraine to San Marino (1997–1999); head of the Council of Representatives of National Minorities under the President of Ukraine (2000–2002); expert for the Human Dimension Mechanism of OSCE (2007–2013); head of Expert Council for State Ethno-Policy at Ministry of Culture of Ukraine (from 2017) etc. He took part in a number of official events held under the auspices of UN, Council of Europe, OSCE. Yevtukh is the Honorary Citizen of State Misiones and the City of Posadas (Argentina, 1997); he is the participant of liquidation of the Chernobyl nuclear power plant accident consequences (1986).

Professor Yevtukh speaks Ukrainian, English, French, German, Greek, Italian, Russian.

Фізика, математика, екологія

Physics, Mathematics, Ecology

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Mutual influence of electrical, mechanical and acoustic fields under the radiation of sound by circular systems with screen, formed from cylindrical piezoceramic radiators

Aleksandr Leiko[1], *Anatolii Derepa*[2], *Ilia Averichev*[3], *Oksana Kocharian*[3], *Yaroslav Starovoit*[4]

Abstract. With the help of coupled fields method in multiply connected regions, we obtained analytical relations describing the physical fields of cylindrical piezoceramic radiators with circumferential polarization, which are part of cylindrical systems with a screen in the internal cavity. Based on the obtained relationships, quantitative estimates of the parameters of the electric, mechanical, and acoustic fields of the radiatos are performed when operating in circular systems with a screen, the analysis of which revealed the degree of influence of the fields on each other.

Keywords: physical fields; circular screen system; piezoceramic cylindrical radiator; circular polarization

Introduction

One of the main parts of complex echolocation systems is their radiation system. At the same time, sound location systems differ in two features that are characteristic only for them, namely, the conversion of one type of energy into another and the formation of acoustic energy in the surrounding space [1]. Each of these features has a number of physical properties, without which, when calculating the parameters of the systems, there are significant differences between their calculated and actual values. At present, when constructing sound emitting systems, the main element for converting electrical energy first to mechanical and then to acoustic is piezoceramic radiators. They are characterized by a deep interconnection between electric, mechanical and acoustic fields [2], influencing energy conversion processes [3–5]. During the formation of acoustic fields in the external space of the systems, interaction between the elements of an acoustic field occurs between their elements. This interaction is

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[3]Central Research Institute of Armament and Military Equipment of the Armed Forces of Ukraine, Povitroflotskyi Ave., 28/69, Kyiv 03049, Ukraine
[4]State Enterprise "Kyiv Scientific Research Institute of Hydrodevices", Surikova Str., 3, Kyiv 03035, Ukraine

due to the repeated exchange of sound waves emitted and reflected elements of the system [1, 6, 7]. In quantitative terms, the degree of acoustic interaction and its influence on the acoustic fields generated by the system is determined by many physical factors. Among them, in the electric field, we single out the nature of the electrical excitation of the radiators of the system; in a mechanical field, the mode composition of the oscillations of the radiators [4, 5, 8], in the acoustic field — the physical and wave properties of the system and its elements [9–11].

In this case, we particularly note the fact that the acoustic field of the radiator, which is involved in the process of energy conversion in it, is the result of the acoustic interaction of all elements of the system.

It is the lack of until recently developed approaches that allow combining piezoceramic radiator s with a single radiation emission process, energy conversion processes in radiators and the formation of an acoustic field in an external space surrounding a system, were the main reason for the differences between the calculated and real values of field parameters of complex radiating systems. It should be noted that recently a number of works have appeared that demonstrate the search and development of new approaches to the solution of the formulated problem [3–8]. However, the abundance of physical factors affecting the processes of sound emission by complex electroacoustic systems suggests that these solutions are only the initial stage of the necessary research.

The purpose of this work is the further development of approaches to the determination of physical fields and their mutual influence on each other when sound is emitted by circular systems of cylindrical piezoceramic radiators with acoustically soft screens in the internal cavity of systems.

Main part

Consider the problem of sound emission by a circular cylindrical system (Fig. 1), formed from a finite number of cylindrical piezoceramic radiators (1) and a cylindrical acoustic screen (2) located in the internal cavity of the system.

The longitudinal axis of the radiators and the screen are parallel to each other. Each of the radiators is an extended sealed piezoceramic sheath, the internal cavity of which is evacuated or filled with air at normal atmospheric pressure or contains liquid or air at overpressure. Piezoceramic shells are circularly polarized. Electrically all the prisms forming the shell are rigidly glued, connected in parallel and an electrical signal of the form is connected to them $\psi_S = \psi_0^S e^{-i\omega t}$, where S — current radiator number in the system, ψ_0^S — voltage amplitude, ω — circular excitation of frequency. The acoustic screen is made in the form of an acoustically soft cylindrical shell.

In the most general form, the computational model of the system under consideration can be represented with the introduction of the following assumptions.

We will assume that the system is formed from $N + 1$ elements, where N — number of radiators, all elements of the system are infinitely long, and the properties of the radiators and the screen are homogeneous along their length. The system is placed in a liquid medium with density ρ and sound velocity c. Inside each radiator there is a medium with density ρ_S and speed

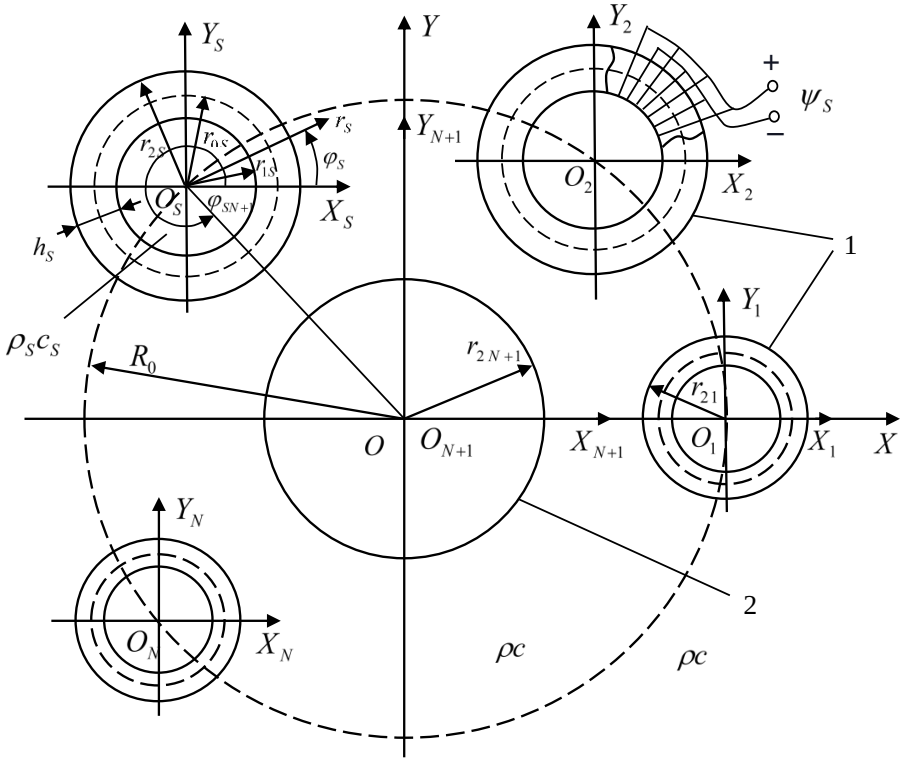

Fig. 1. Normal section of the cylindrical system of radiators with a screen

of sound c_S. In this case, the radiators themselves are thin piezoceramic shells, the circumferential polarization of which is created by the parallel connection M_S of prisms rigidly glued to each other, on the side surfaces of which thin electrodes are applied.

In accordance with the given calculation model, to determine the physical fields of a circular cylindrical system with a screen, it is necessary to carry out a joint solution of such differential equations:

– Helmholtz equations describing the motion of elastic media (gas or liquid) inside and outside the elements of the system:

$$\Delta\Phi^{(S)} + k_s\Phi^{(S)} = 0; \quad S = 1, \ldots, N+1; \tag{1}$$

– equations of motion [2] of thin piezoceramic shells of radiators with circular polarization in displacements:

$$\begin{aligned} &(1+\beta_S)\frac{\partial^2 u^{(S)}}{\partial\varphi_S^2} + \frac{\partial w^{(S)}}{\partial\varphi_S} - \beta_S\frac{\partial^3 w^{(S)}}{\partial\varphi_S^3} = a_S\gamma_S\frac{\partial^2 u^{(S)}}{\partial t^2}, \\ &-\frac{\partial u^{(S)}}{\partial\varphi_S} + \beta_S\left(\frac{\partial^3 u^{(S)}}{\partial\varphi_S^3} - \frac{\partial^4 w^{(S)}}{\partial\varphi_S^4}\right) - w^{(s)} + \frac{e_{33}^{(S)} r_{OS}}{C_{33\,S}^{E(s)}}E_\varphi^{(S)} \\ &\qquad + \frac{a_S}{h_S}q_r^{(S)} = a_S\gamma_S\frac{\partial^2 w^{(S)}}{\partial t^2}; \quad S = 1, \ldots, N; \end{aligned} \tag{2}$$

– equations of forced electrostatics for piezoelectric ceramics of the S-th radiator:

$$\vec{E}_S = -\operatorname{grad}\psi_S; \qquad \operatorname{div}\vec{D}_S = 0; \qquad S = 1, \ldots, N. \tag{3}$$

In expressions (1)–(3) accepted: Δ — the Laplasian operator; S — acoustic potential of the S-th radiator; k and k_{2S} — wave numbers of media outside and inside the S-th radiator; $u^{(S)}$ and $w^{(S)}$ — tangent and normal components of the displacement vector of points of the middle surface of the S-th radiator;

$$\eta_S = \frac{h_S^2}{12r_{0S}^2}(1 + e_{33}^{2(S)}/C_{33}^{E(S)}\varepsilon_{33}^{S(S)}); \qquad a_S = r_{OS}^2/C_{33}^{E(S)};$$

q_{rS} — external load of the S-th radiator; $C_{33}^{E(S)}$, $\varepsilon_{33}^{S(S)}$, $e_{33}^{(S)}$, γ_S — respectively, the modulus of elasticity at zero electric intensity, the dielectric constant at zero deformation, the piezoelectric constant and the density of the material of the piezoceramic shell of the S-th radiator, $\vec{E}^{(S)}$ and $\vec{D}^{(S)}$ — vectors of intensity and induction of the electric field of the S-th radiator.

The region of existence of the sound field is multiply connected, since the sound fields of the radiators are formed in two areas — the external $\Phi_1^{(S)}$ and internal $\Phi_2^{(S)}$, and the acoustic field of the acoustic screen $\Phi_1^{(N+1)}$ — only in the outer area. The boundaries of areas are determined by the relations: for internal areas

$$0 \le |\varphi_S| \le \pi, \quad 0 \le r_S \le r_{1S} = r_{0S} - h_S/2, \qquad S = 1, \ldots, N;$$

for external areas

$$0 \le |\varphi_S| \le \pi, \quad r_S \ge r_{2S} = r_{0S} + h_S/2, \qquad S = 1, \ldots, N;$$

$$r_{N+1} > r_{2,N+1}.$$

Taking into account the above boundaries, the kinematic and dynamic conditions of conjugation of sound fields on these boundaries take the form:

– on the surfaces of each radiator, the conditions of equality of the velocities of vibration of the particles of the media and the velocities of the normal displacements of the surfaces of the radiators are satisfied:

$$-\frac{\partial\Phi_1(r_S, \varphi_S)}{\partial r_S} = \frac{\partial w^{(S)}}{\partial t}, \qquad 0 \le |\varphi_S| \le \pi,\ r_S = r_{2S},\ S = 1, \ldots, N, \tag{4}$$

$$-\frac{\partial\Phi_2^{(\mathrm{S})}(r_S, \varphi_S)}{\partial r_S} = \frac{\partial w^{(S)}}{\partial t}, \quad 0 \le |\varphi_S| \le \pi,\ r_S = r_{1S},\ S = 1, \ldots, N, \tag{5}$$

where $\Phi_1(r_S, \varphi_S)$ — the radiation field of the system, expressed in the coordinates of the S-th radiator;

– on the surface of each radiator, the condition of equality of the normal component of the stress tensor σ_r^S sound pressure taken with the opposite sign:

$$\sigma_r = q_r = -(p_1 - p_2^{(S)}), \quad 0 \le |\varphi_S| \le \pi,\ r_S = r_{0S},\ S = 1, \ldots, N, \tag{6}$$

where $p_1 = \rho\dfrac{\partial\Phi_1}{\partial t}$ and $p_2^{(S)} = \rho_S\dfrac{\partial\Phi_2^{(S)}}{\partial t}$ — radiation loads from dynamic pressures;

– on the surface of an acoustically soft screen, the condition that the sound pressure is zero:

$$\Phi_1(r_{N+1}, \varphi_{N+1}) = 0, \quad 0 \le |\varphi_{N+1}| \le \pi, \quad r_{N+1} = r_{2,\,N+1}. \tag{7}$$

Electrical boundary conditions taking into account the dynamic deformation of the S-th cylindrical radiator voltage $\psi_S = \psi_0^S e^{-i\omega t}$ and equations (3) take the form [2]:

– the electric field strength in the material of the piezoceramic shell of the S-th radiator with a circumferential polarization:

$$E_\varphi^{(S)} = -\frac{\psi_0^{(S)} M_S}{2\pi r_{0S}}, \quad S = 1, \ldots, N; \tag{8}$$

– components of electrical induction along the radius $D_r^{(S)}$, longitudinal axis $D_z^{(S)}$ and circumference $D_\varphi^{(S)}$ equal respectively:

$$\begin{gathered} D_r^{(S)} = 0; \qquad D_z^{(S)} = 0; \\ D_\varphi^{(S)} = \varepsilon_{33}^{S(S)} E_\varphi^{(S)} + e_{33}^{(S)} \left(\frac{1}{r}\frac{\partial u^{(S)}}{\partial \varphi_S} + \frac{w^{(S)}}{r_{(S)}} \right). \end{gathered} \tag{9}$$

These conditions are complemented by radiation conditions at infinity and the absence of features in the internal cavities of each of the radiators of the system.

To solve the formulated problem, we use the method of coupled fields in multiply connected regions. Imagine the displacement of the shells of the radiators, describing the mechanical fields of the radiators, in the form of expansions $u^{(S)}$ and $w^{(S)}$ on its own forms of oscillations of shells in vacuum

$$\begin{aligned} u^{(S)} &= \sum_n u_n^{(S)} e^{in\varphi_S}; \\ w^{(S)} &= \sum_n w_n^{(S)} e^{in\varphi_s}; \end{aligned} \tag{10}$$

Coefficients $u^{(S)}$ and $w^{(S)}$ allow to take into account the interaction of acoustic, mechanical and electric fields in the process of conversion of electrical energy into mechanical and acoustic.

Acoustic fields of the system that satisfy the Helmholtz equation (1) are described as follows.

The acoustic field of the system in its environment will be represented as a superposition of the fields $\Phi_1^{(S)}$ created by each element of the system:

$$\Phi_1 = \sum_{S=1}^{N+1} \Phi_1^{(S)} \tag{11}$$

In this case, all the fields $\Phi_1^{(S)}$ should be determined taking into account the interaction of all elements of the system with each other by the acoustic field resulting from the multiple scattering of waves on all elements of the system. Acoustic fields created by radiators and a screen in the external environment are represented by expansions in wave cylindrical functions satisfying the radiation condition at infinity:

$$\Phi_1^{(S)}(r_S, \varphi_S) = \sum_n A_n^{(S)} H_n^{(1)}(kr_S) e^{in\beta\varphi_S}, \quad S = 1, \ldots, N+1. \tag{12}$$

Acoustic fields arising from the radiation of sound in the internal regions of the radiators and having no features in them can be described by the expressions:

$$\Phi_2^{(S)}(r_S, \varphi_S) = \sum_n B_n^{(S)} J_n(k_{2S} r_S) e^{in\varphi_S}, \quad S = 1, \ldots, N+1. \tag{13}$$

In relations (12) and (13), the traditional designations of cylindrical functions are used; through coefficients $A_n^{(S)}$ interaction of elements of the system by the acoustic field due to multiple scattering of waves is taken into account; through coefficients $B_n^{(S)}$ interaction of acoustic fields in the internal areas of their radiators is taken into account.

For determining the coefficients of decomposition $u_n^{(S)}$, $w_n^{(S)}$, $A_n^{(S)}$ and $B_n^{(S)}$ it is necessary to use relations (2), (4)–(7). Substitution of formulas (10) into expression (2) allows us to express $u_n^{(S)}$ through $w_n^{(S)}$ in the following form:

$$u_n^{(S)} = \frac{i(n + \beta_S n^3)}{(1+\beta_S)n^2 - \omega^2 \alpha_S \gamma_S} w_n^{(S)}. \tag{14}$$

Since the entered into the expression (11) fields are $\Phi_1^{(S)}$ specified in their local coordinate systems, relations (11) and (12) cannot be substituted into the boundary conditions (4)–(7) and equation (1) and require the representation in local coordinates of that system element whose boundary conditions are used. The transfer of coordinate systems is provided using the addition theorems for cylindrical wave functions [1]:

$$H_m^{(1)}(kr_q) e^{im\varphi_q} = \sum_n J_n(kr_S) H_{m-n}^{(1)})(kr_{qS}) e^{i(m-n)\varphi_{qS}} e^{in\varphi_S}, \tag{15}$$

where r_{qS} and φ_{qS} — polar coordinates of the origin of the coordinate system O_S in the coordinates of the q-th system.

Algebraization of systems of functional equations (1)–(7) using relations (8), (10)–(15) and the properties of completeness and orthogonality of systems of angular functions on the interval $[0, 2\pi]$ allows you to get to determine the unknown coefficients of expansions $u_n^{(S)}$, $w_n^{(S)}$, $A_n^{(S)}$ and $B_n^{(S)}$ infinite system of linear algebraic equations of the form:

$$
\left.
\begin{aligned}
&- B_n^{(S)} J'(k_{2S} r_{1S}) + i c_{2S} w_n^{(S)} = 0, \\
&\qquad\qquad S = 1, \ldots, N,\ n = -\infty,\ 0,\ \infty; \\
&i c w_n^{(S)} - \left[A_n^{(S)} H_n^{(1)'}(k r_{2S}) \right. \\
&\quad \left. + \sum_{\substack{q=1 \\ q \neq S}}^{N+1} \sum_m A_m^{(q)} J_n'(k r_{2S}) H_{m-n}^{(1)}(k r_{qS}) e^{i(m-n)\varphi_{qS}} \right] = 0, \\
&\qquad\qquad S = 1, \ldots N; \\
&A_n^{(N+1)} H_n^{(1)}(k r_{2N+1}) \\
&\quad + \sum_{q=1}^{N} \sum_m A_m^{(q)} J_n'(k r_{2N+1}) H_{m-n}^{(1)} e^{i(m-n)\varphi_{qN+1}} = 0, \\
&\qquad\qquad n = -\infty,\ 0,\ \infty; \\
&R_n^{(S)} w_n^{(S)} + \frac{\alpha_S}{h_S} i\omega\rho \left[A_n^{(S)} H_n^{(1)}(k r_{qS}) \right. \\
&\quad \left. + \sum_{\substack{q=1 \\ q \neq S}}^{N+1} \sum_m A_m^{(q)} J_n(k r_{2S}) H_{m-n}^{(1)}(k r_{qS}) e^{i(m-n)\varphi_{qS}} \right] \\
&\quad - \frac{\alpha_S}{h_S} i\omega\rho_S B_n^{(S)} J_n(k_{2S} r_{1S}) \\
&\quad = - \frac{e_{33}^{(S)}}{C_{33}^{E(S)}} \frac{M_S \psi_0^{(S)}}{2\pi} \int_0^{2\pi} e^{in\varphi_S} d\varphi_S, \\
&\qquad\qquad S = 1, \ldots, N,\ n = -\infty,\ 0,\ \infty,
\end{aligned}
\right\} \quad (16)
$$

where $R_n^{(S)} = n^2(1+\beta_S n^2)^2 - (1+\beta_S n^4 - \alpha_S\gamma_S\omega^2)(n^2+\beta_S n^2 - \alpha_S\gamma_S\omega^2)/(1+\beta_S)n^2 - \alpha_S\gamma_S\omega^2$, the prime means the derivative of the function.

Let us define expressions that allow quantitative estimates of the magnitude of the electric current flowing in the excitation circuit of the S-th radiator of a circular system of radiators with a screen. From physical considerations it is clear that the placement of cylindrical radiators in such a system (Fig. 1) violates the radial symmetry of their radiation load and, as a result, the radial symmetry of mechanical vibrations of the piezoceramic shells of radiators. Therefore, the magnitude of the excitation current in the circuit of each of M_S parallel connected piezoceramic prisms of the S-th radiator will be tied to the angular position of these prisms in the radiator shell. Then the expression for the total current $I^{(S)}$ in the excitation circuit of the S-th emitter of the system under consideration takes the form:

$$
I^{(S)} = S_{el}^S \sum_{j=1}^{M_S} \frac{\partial D_{\varphi_S}^{(j)}}{\partial t}, \quad (17)
$$

where S_{el}^{S} — the area of the electrode deposited on the flat surface of the piezoceramic prism of the S-th radiator.

Having executed a number of transformations, expression (17) with regard to relations (8)–(10) can be represented as:

$$I^{(S)} = -i\omega S_{el}^{S}\left\{-\varepsilon_{33}^{S(\mathrm{S})}\frac{\psi_{0S}M_S^2}{2\pi r_{0S}} + \frac{e_{33}^{(S)}}{r_{0S}}\sum_{j=1}^{M_S}\left[\sum_n inu_n^{(S)}e^{in\frac{2nj}{M_S}} + \sum_n w_n^{(S)}e^{in\frac{2nj}{M_S}}\right]\right\}. \tag{18}$$

Analysis of the relation (18) shows that the total electric current in the excitation circuit of each S-th piezoceramic radiator ($S = 1, \ldots, N$) of the circular system of radiators with a screen is the sum of two components of the current — capacitive and dynamic.

The obtained expressions allow you to perform quantitative estimates of the parameters of the electric, mechanical and acoustic fields of the radiators when operating in circular systems with a screen and, based on the analysis of the results obtained, identify the degree of influence of the fields on each other.

As it was already mentioned, in radiating systems based on piezoceramic radiators, the radiation process is determined by the mutual coupling of electric, mechanical and acoustic fields. Let us analyze these relations and estimate the priorities of their influence in the formation of the physical fields under consideration. To do this, we use the results of a numerical experiment to estimate the frequency and angular dependences of the amplitudes and phases of the acoustic, mechanical, and electric fields of the radiators as part of the systems under consideration. Calculations were made according to the above formulas for radiating systems with parameters:

$N = 3$; $r_0 = 0,068$ m; $h = 0,008$ m;
$M_s = 48$;
$e_{33}^{(S)} = 14,9$ C/m^2;
$\varepsilon_{33}^{(S)} = 1280 \cdot 8,85 \cdot 10^{-12}$ F/m;
$\gamma_S = 7210$ kg/m ^{3};
$C_{33}^{(S)} = 13,6 \cdot 10^{-10}$ N/m^2;
$\rho = 10^3$ kg/m^3;
$c = 1,5 \cdot 10^3$ m/s;
$r_{2N+1} = 0,072$ m;
$R_0 = r_{2N+1} + r_0 + 5$ mm;
$\rho_S c_S = 0$ for all $S = 1, \ldots, N$.

The frequency characteristics of the amplitudes and phases of the fields were calculated on the surface of the radiators at points opposite the screen from the outside of the system.

The analysis of the above analytical relations allows to establishing three important physical features that determine the interaction of the fields of the radiating circular system with the screen. The first feature is connected with the interaction of the electric and mechanical fields of the radiators and consists in the fact that with the chosen method of electrical loading of circular cylindrical piezoceramic radiators their electric field is radially symmetric. Therefore,

in the mechanical field of a circular piezoceramic radiator, such an electric field can excite only one zero own mode of oscillation and "pump" energy into it only in this zero mode [4]. This can be seen from the fourth expression of the system of equations (16), where the right-hand side describing the electric field of the radiator is related to its mechanical field and is not zero only on the zero (n = 0) mode of oscillation of the S-th radiator. Thus, the relationship between the electric and mechanical fields in a cylindrical piezoceramic transducer seems relatively simple.

The second feature is associated with the interaction of the acoustic fields of all elements of the radiating system, due to the repeated exchange between them of the radiated and reflected waves. The degree of this interaction, expressed by the double sum in relations (16), and the level of its influence on the generated fields is determined in the expressions of system (16) by the value of the multiplier $H^{(1)}_{m-n}(kr_{qS})$, which describes the interaction between the m-th and n-th order acoustic waves created by the q-th and S-th elements of the system ($q = 1, \ldots, N+1$; $S = 1, \ldots, N+1$), that are spaced over a distance r_{qS}.

The third feature characterizes the mutual influence of the acoustic and mechanical fields of the radiators within the system under study and the dependence of this influence on the acoustic interaction of its elements. The physical consequence of the acoustic interaction of elements of a circular system with a screen is a violation of the radial symmetry of the acoustic radiation loading of its radiators. Indeed the form of expressions analysis (16), within $H^{(1)}_{m-n}(kr_{qS}) \to 0$ the acoustic interaction disappears and when the cylindrical radiators of the system at the zero mode of their mechanical vibrations are electrically excited, the acoustic fields they generate have radial symmetry. This indicates that in the absence of acoustic interaction of the elements of the system, the connection between the acoustic and mechanical fields is characterized by the same relative simplicity as the connection between the electric and mechanical fields of the radiators of the system. The occurrence of the acoustic interaction of elements in the system under study fundamentally changes the situation. It is thanks to him that the radial symmetry of the acoustic loading of each radiator of a circular system with a screen is broken. In the mechanical field of the radiator with broken symmetry appear, as it follows from the analysis of the system of equations (16), the oscillations that follow the zero mode. This means that the energy of the electric field, "pumped" into the mechanical field of the radiator only at the zero mode of its oscillations, is redistributed between all forms of oscillations. Thus, due to the emergence in the system of interaction of the acoustic fields of its elements, single-mode cylindrical piezoceramic radiators as part of the system acquire the property of multi-mode.

Let's confirm now the results of the presented theoretical reasoning by analyzing specific numerical data.

An analysis of the angular dependences of the amplitudes of the acoustic field on the surfaces of the radiators of a circular system with a screen (Fig. 2) suggests that the occurrence of interaction of the system elements in the external environment over the acoustic field is the cause of the considerable heterogeneity of the amplitude distribution under study.

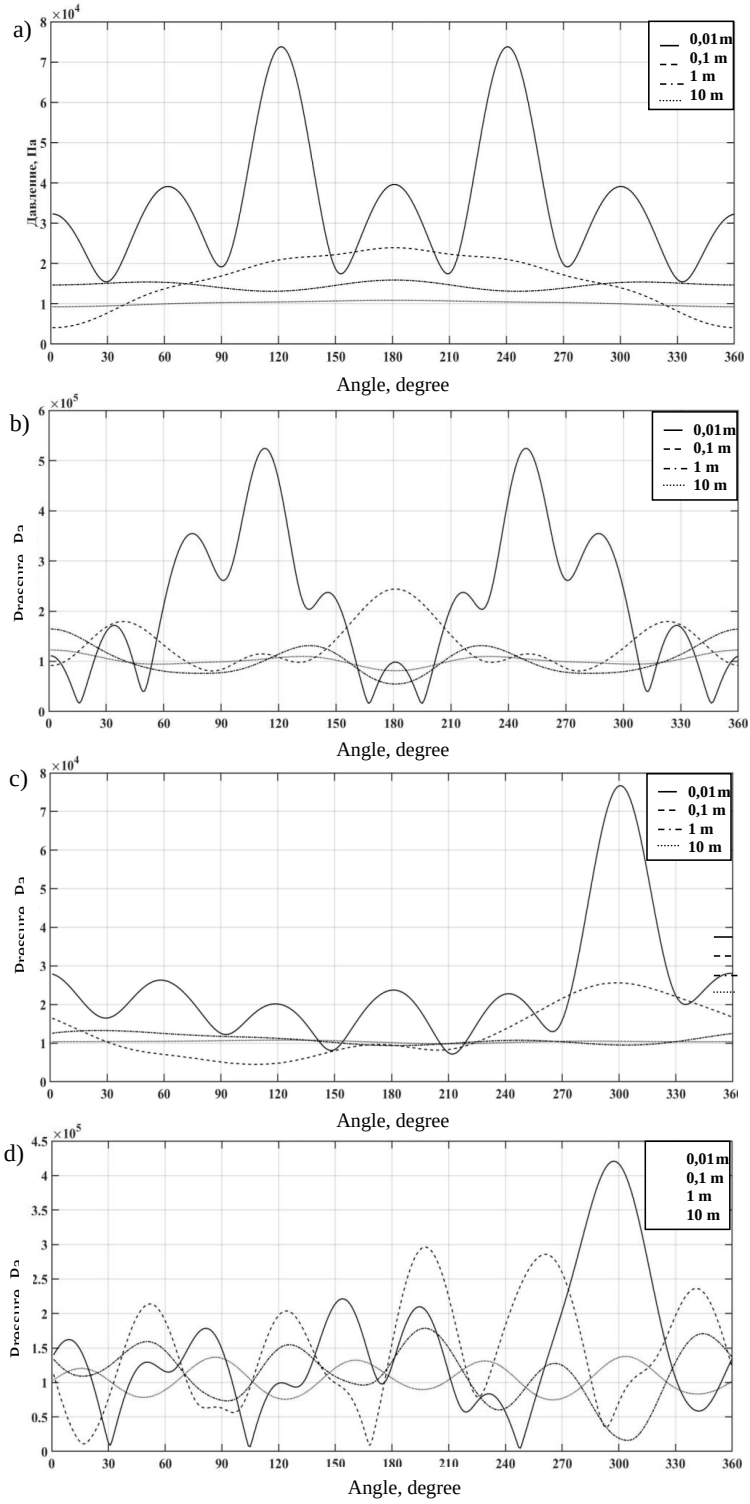

Fig. 2. Angular dependences of the amplitudes of the acoustic pressure of the average (a, b) and extreme (c, d) radiators of a circular system with a screen with sector sound emission at different frequencies of 2890 Hz (a), 9500 Hz (b), 2890 Hz (c), 9940 Hz (d), for different distances l between system elements:
$1 - l = 10^{-2}$ m; $2 — l = 10^{-1}$ m; $3 — l = 1$ m; $4 — l = 10$; m.

If the acoustic interaction was absent, then all radiators of the system would have a uniform pressure distribution on their surfaces. The degree of violation of the radial symmetry of the acoustic loading depends on the location of the radiator in the system and on the wave distance between its elements.

While maintaining radial symmetry of electrical loading of piezoceramic cylindrical radiators in a circular system with a screen, a natural consequence of the violation of the radial symmetry of their acoustic loading is the appearance of radiators in mechanical fields other than zero subsequent vibration modes (Fig. 3).

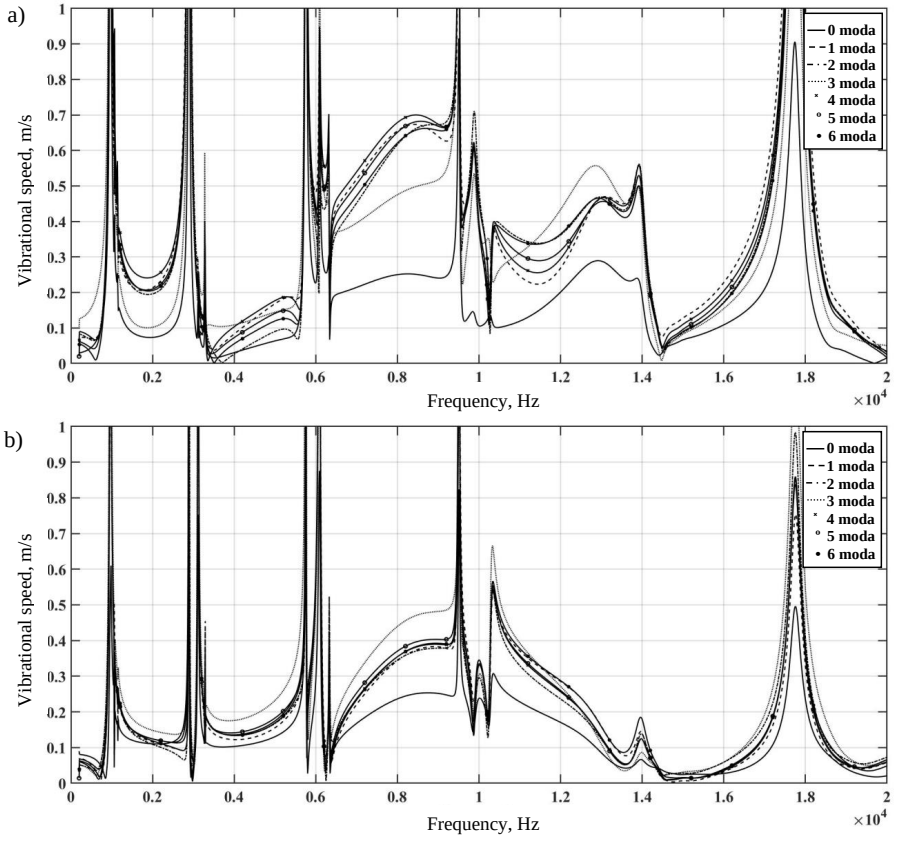

Fig. 3. Frequency dependences of the amplitudes of the modes of the oscillatory velocity on the surface of the average (a) and extreme (b) radiators that work as part of the system when the distance between the surfaces of the elements $l = 10^{-2}$ m.

At the same time, at individual frequencies, the amplitudes of the vibrational speeds of the newly generated modes are comparable or even exceed the amplitude of the speed of the zero mode, which is evidence of the effective redistribution in the mechanical field of the energy of the zero mode between the newly generated modes. When the distance between the elements of the circular system changes, the ratio between the amplitudes of the vibrational speeds of the zero and subsequent modes changes, increasing for the zero mode with increasing kR_0.

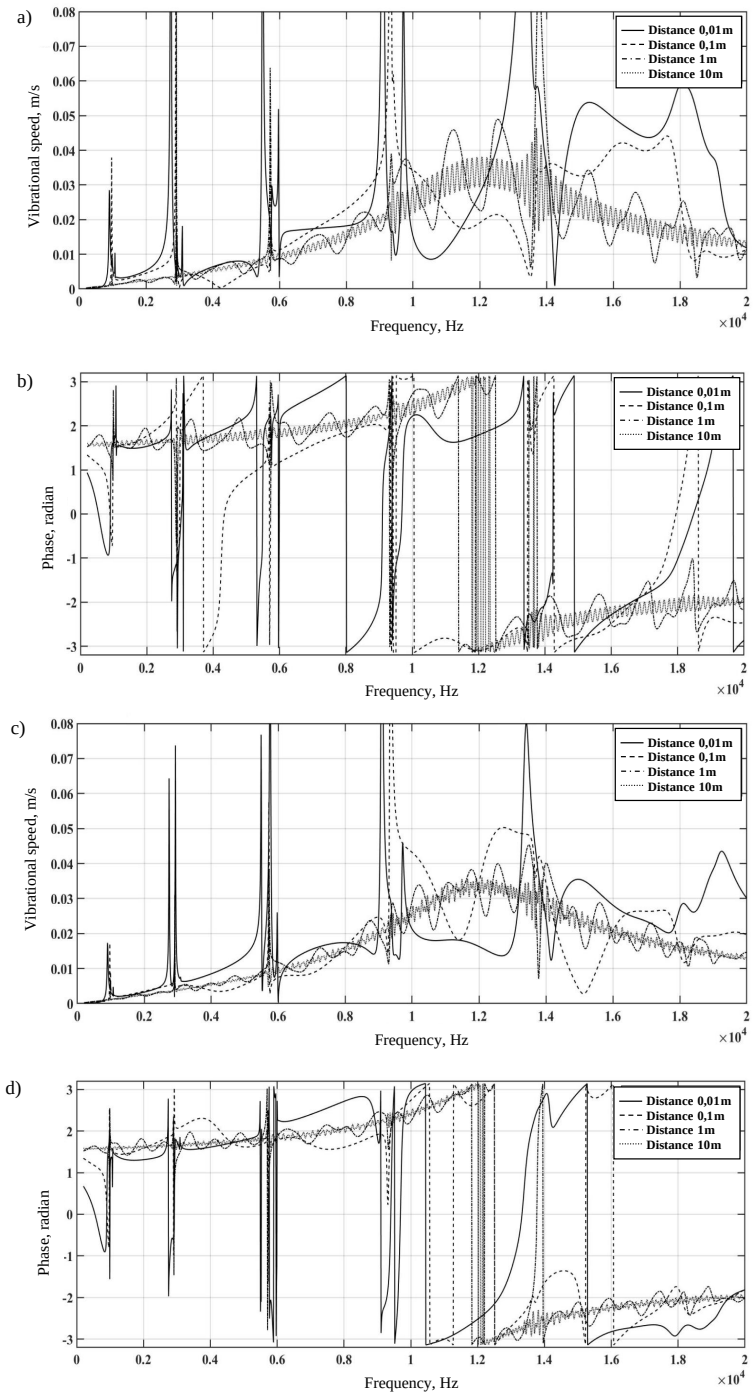

Fig. 4. Frequency dependences of the amplitudes (a, c) and phases (b, d) of the vibrational speeds of the average (a, b) and extreme (c, d) radiators of a circular system with a screen for different distances between the surfaces of the system elements during sector radiation.

The generation of new vibration modes with their own vibrational speeds, which is the result of the interaction of the acoustic fields of the elements of a circular system with a screen in the external space of the system, significantly changes the frequency characteristics of its radiators. The decisive influence of the acoustic interaction on the mechanical fields of the radiators in the composition of the system is shown by the curves of Fig. 4. Their analysis shows that it is the interaction of the system elements in its external acoustic field, the magnitude and degree of influence of which depend on the distance between the elements, determines the regularities of the behavior of the frequency dependences of the amplitudes and phases of the parameters of mechanical fields. As the distance increases, the forms of the frequency dependences, the frequencies of the newly generated own mechanical resonances of the system and the amplitudes of their vibrational speeds change. At large distances, multiple exchanges of radiated and reflected waves between elements of the system weakens, the frequency characteristics of all radiators of the system become the same and take on the characteristics of the radiator when it is operated outside the system.

The interrelation between the mechanical and acoustic fields of the radiators of the system in the process of conversion of electric energy into acoustic energy is manifested both in the change of the mechanical fields of the radiators under the influence of the acoustic field of the circular system with the screen, and in the reverse effect of the modified mechanical fields on the acoustic fields of these systems, as shown by the graphs Fig. 5. Their analysis shows that each mode of the mechanical field of the radiator as part of a circular system with a screen forms its component of the acoustic field in the external space of the system (Fig. 5b, Fig. 5c), and the full field of the system (Fig. 5a) is the result of the superposition of the constituent elements of all elements of the system with their amplitudes and phases. Due to this, a number of features of the full acoustic field of a circular system arise, which consist in enriching the spectrum of the natural frequencies of the system and expanding this spectrum to low frequencies. In this case, in a circular system with a screen, self-resonant frequencies appear, 5–10 times lower than the frequencies of the mechanical resonance of the piezoceramic shells of the system radiators.

In conclusion, it is interesting to quantify the influence of all the above-mentioned changes in the acoustic and mechanical fields of the system and its radiators on the electric fields that excite the radiators of the system. Curve analysis Fig. 6 and comparing them with the graphs of Fig. 7 shows that the earlier conclusion that the energy of the electric field is "pumped" into the mechanical field of the radiator with the chosen method of electrically loading it only at the zero mode of its oscillations is retained. However, the electric field of the radiator (Fig. 6) tracks all the subtleties that its mechanical field (Fig. 7) acquired under the influence of the acoustic field of a circular system with a screen.

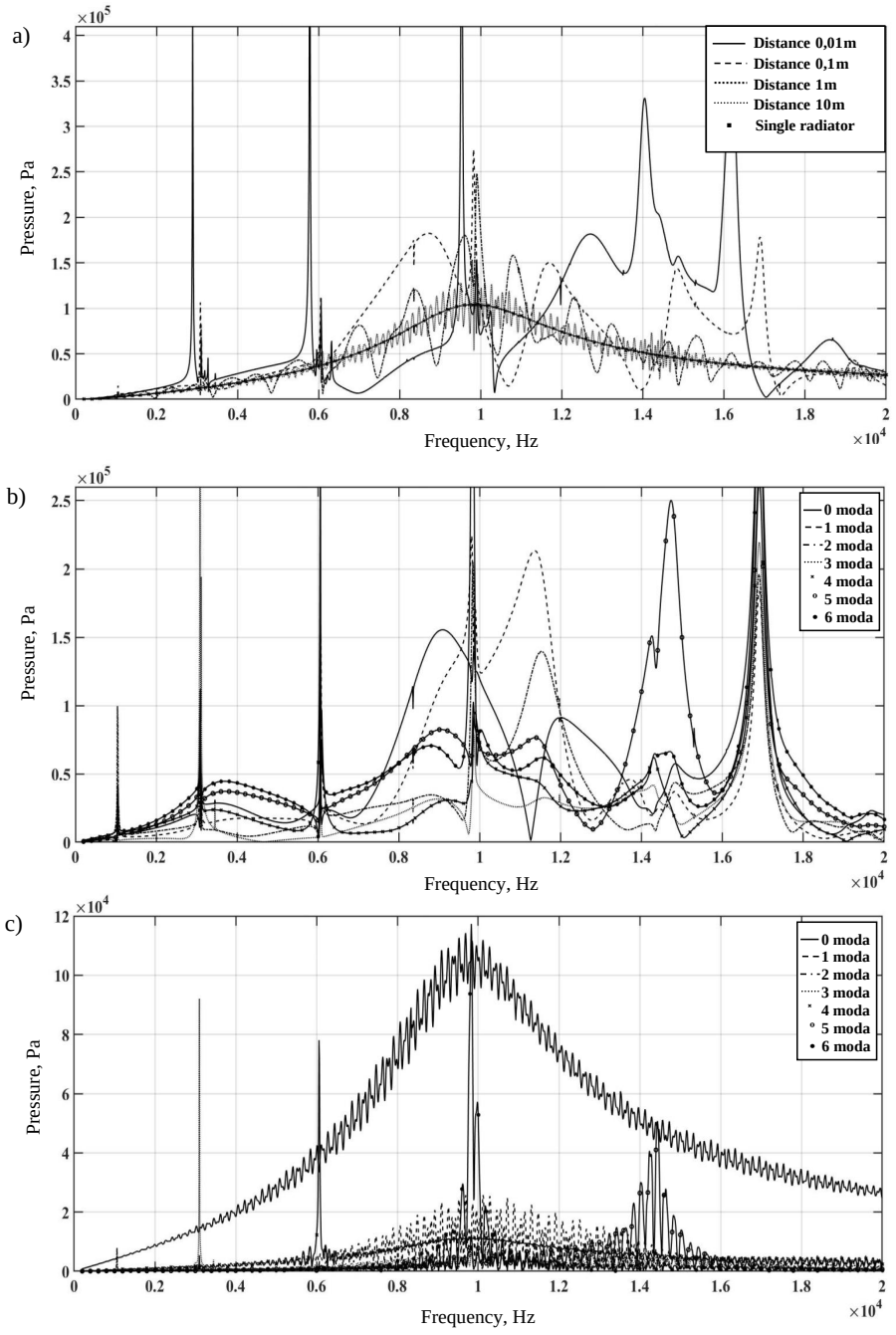

Fig. 5. Frequency dependences of the amplitudes of the total (a) acoustic pressure and its modal components of the average radiators with sector radiation of circular systems with a screen at different distances l between the surfaces of the system elements: $l = 0,1$ m (b); $l = 10$ m (c)

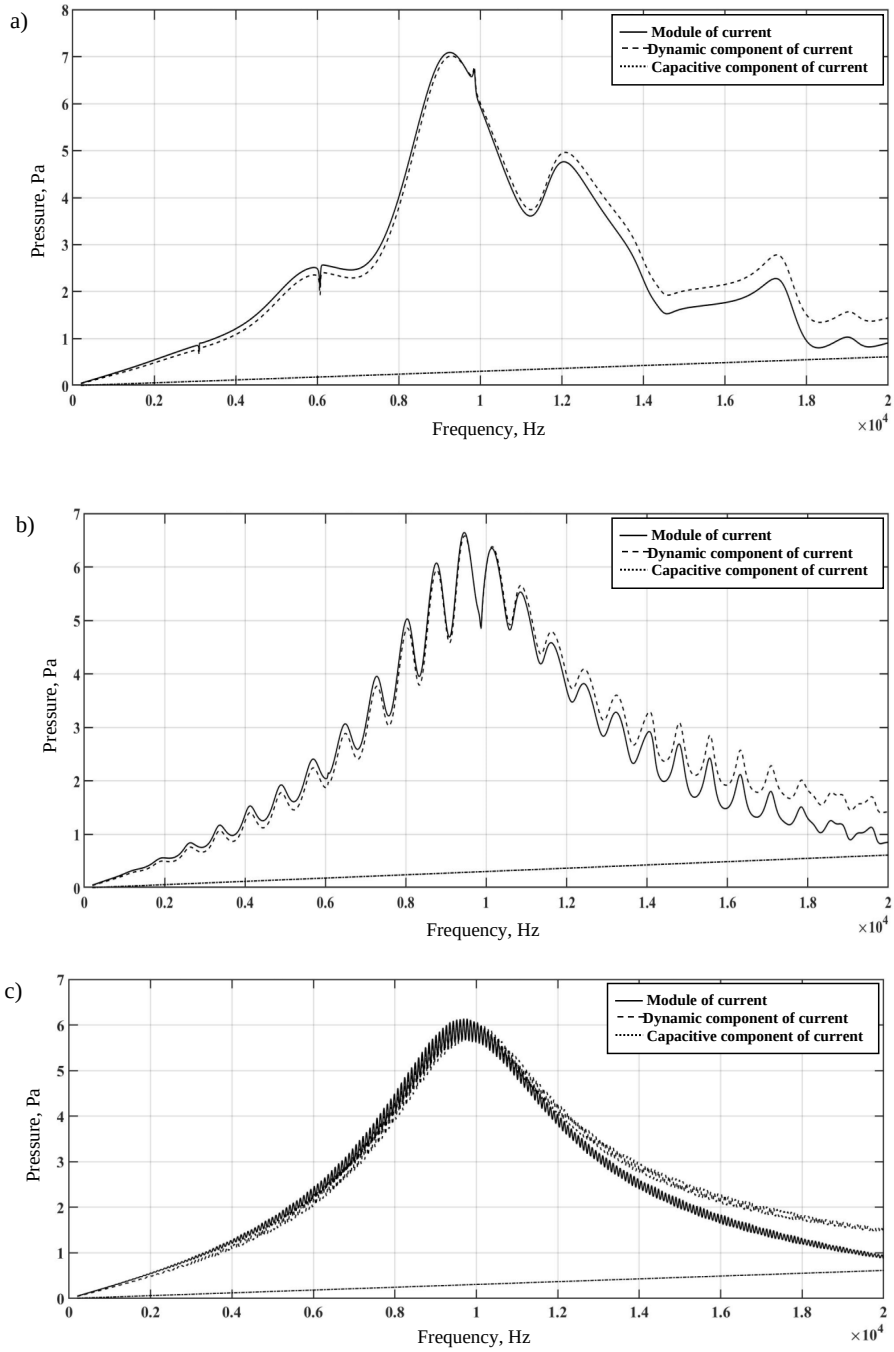

Fig. 6. Frequency dependences of the amplitudes of the electric current in the external circuits of the radiators of a system with a screen with circular radiation and distances between the surfaces of the screen r_{2N+1} and radiators r_{2S}, equal to 0.1 m (a), 1 m (b), 10 m (c)

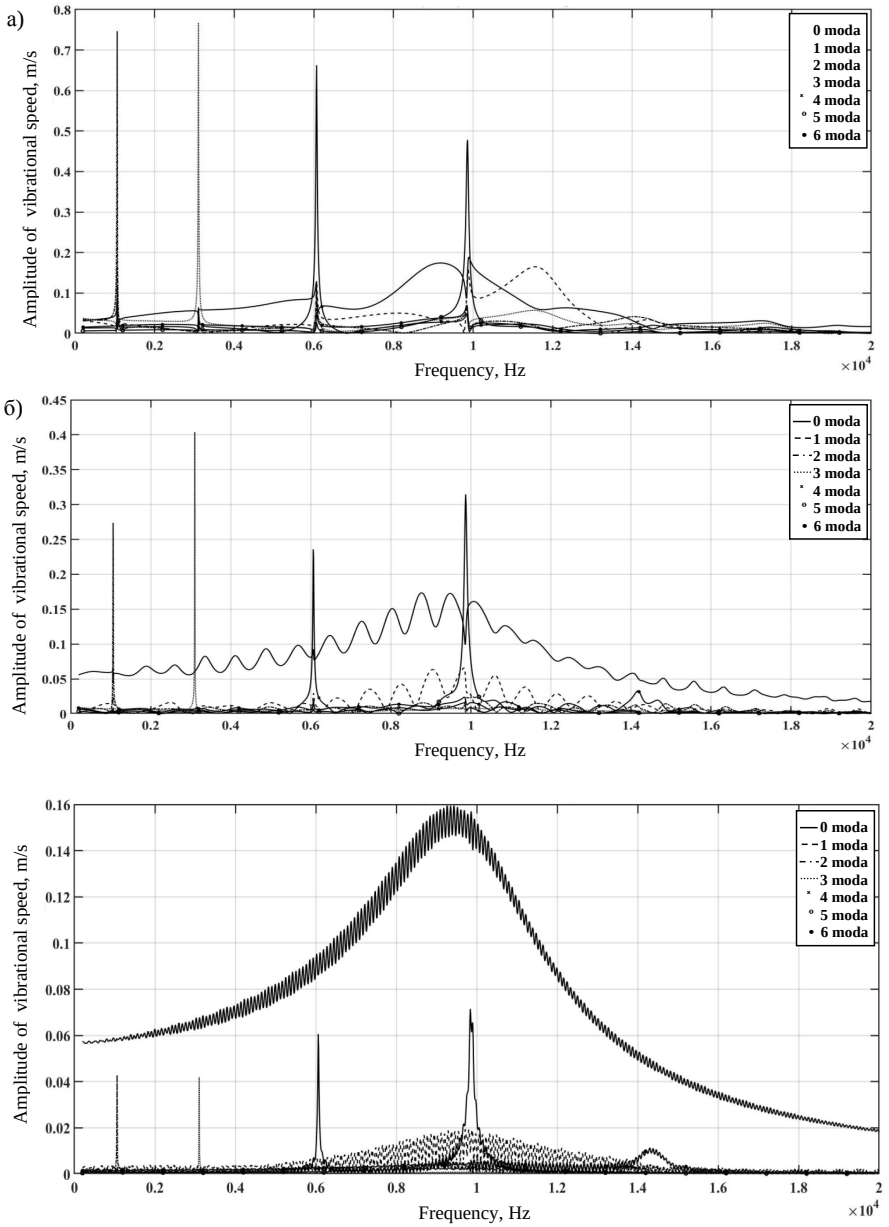

Fig. 7. Frequency dependences of the amplitudes of the modes of the vibrational speed of the radiators of a system with a screen with circular radiation and distances between the surfaces of the screen r_{2N+1} and radiators r_{2S}, equal to 0.1 m (a), 1 m (b), 10 m (c).

Conclusion

The process of radiation of sound by circular systems with a screen formed from cylindrical piezoceramic radiators is characterized by two functional features, namely, the conversion of electrical energy into mechanical energy, and the latter into acoustic energy and the formation of acoustic energy in spaces surrounding the system. In this case, a number of interactions of the indicated physical fields arise. When converting electrical energy into acoustic, the electric, mechanical and acoustic fields interact. During the formation of the acoustic field of the system in the surrounding spaces, the interaction of the acoustic fields of its elements occurs, due to the multiple exchange of radiated and reflected waves between its elements. With the radial symmetry of the exciting radiator of the electric field, its interaction with the mechanical field of a cylindrical piezoceramic radiator occurs only at the zero mode of its mechanical oscillations. It has been established that the interaction of the mechanical fields of the radiators with the acoustic field of the system is a much more complex process. In this process, the decisive role is played by the interaction of the acoustic fields of the system elements in the external space. It is thanks to this interaction that the radial symmetry of the acoustic loading of a single cylindrical radiator is broken during its operation as part of the system, leading to the multimode radiators. Analytical relationships have been obtained and, on their basis, by a method of numerical experiment, qualitative and quantitative laws have been revealed on the influence of the studied interactions on the radiation of sound by circular systems with screen.

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Mathematical Modelling of Radionuclide Migration and Reliability of Natural Systems

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As a result of the accident at the Chernobyl Nuclear Power Plant (ChNPP) in 1986, about 3.5 million hectares of forests in Ukraine fell under radioactive contamination, and the entire forests in Ukraine occupy 9.9 million hectares. Territories of other countries were significantly affected. In addition to Ukraine, the Republic of Belarus and the Russian Federation, the influence of the Chornobyl nuclear disaster was felt by Sweden, Norway, Poland, Austria, Switzerland, Germany, Finland, Great Britain and other countries [1–3]. Another significant radioactive contamination of the territories was the result of the accident at the nuclear power plant Fukushima-1 in 2011. In general, there were more than 100 serious accidents involving the use of nuclear energy in the whole world, and more than 50 occurred after the Chernobyl disaster. Consequently, the problem of radioactive contamination remains relevant, and the results obtained from the analysis of the Chernobyl catastrophe may be useful for modelling and predicting other similar phenomena.

Mathematical modelling is one of the most effective methods for studying the migration processes of radioactive substances in the environment. The Kyiv school of scientists has proposed a methodology for assessing the radiation state of ecological systems based on the use of mathematical box models, the theory of reliability, and radio capacity parameters assessment.

Application of Box Models in Radioecology

Stationary box models are based on the postulate of existing a stable statistical equilibrium in the system "an ecosystem — an organism — an environment". In this case, the distribution of radionuclide activity in each of the boxes is considered uniform.

Figure 1 a) presents a relatively simple ecosystem — a stationary box model consisting of four boxes with given initial radioactivity $\tilde{N}_1$ in the soil and the transition coefficients ($\hat{E}_T$) between boxes $\hat{E}_1, \hat{E}_2, \hat{E}_3$.

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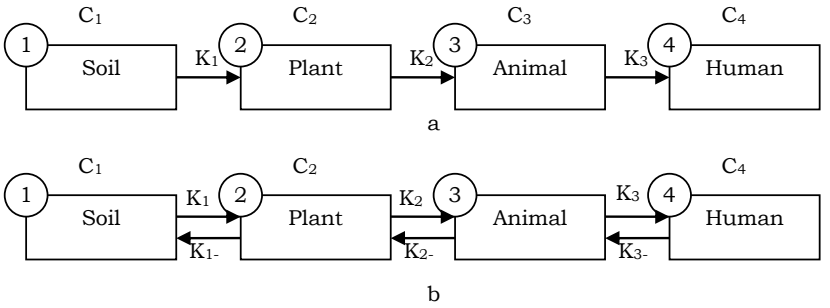

Fig. 1. The simplest stationary (a) and dynamic (b) box models of an ecosystem

According to this data, using the stationary box model, it is easy to calculate the activity of radionuclides in other boxes:

$$\begin{aligned} \tilde{N}_2 &= \hat{E}_1 \cdot \tilde{N}_1, \\ \tilde{N}_3 &= \hat{E}_2 \cdot \tilde{N}_2 = \hat{E}_1 \cdot \hat{E}_2 \cdot \tilde{N}_1, \\ \tilde{N}_4 &= \hat{E}_3 \cdot \tilde{N}_3 = \hat{E}_1 \cdot \hat{E}_2 \cdot \hat{E}_3 \cdot \tilde{N}_1. \end{aligned} \tag{1}$$

In addition to simple stationary box models, dynamic box models are widely used; they are based on two basic assumptions:

1) The ecosystem can be divided into several interacting boxes, which eventually undergo radionuclide exchange. Radionuclides that arrive in the box instantly mix the same way in all parts of the box at any given time.
2) The loss of the radionuclides by the box is proportional to the activity of the radionuclides in this box. The transfer of radionuclides from one box to another occurs according to the first order kinetics laws; it is described by a system of ordinary differential equations. In this case, the proportionality coefficient between the specific activity of radionuclides in the box and arrival of radionuclides from this box to any other (the coefficient of radionuclide transfer between boxes) is constant.

Figure 1 b) presents the corresponding ecosystem (dynamic box model), where $\tilde{N}_1, \tilde{N}_2, \tilde{N}_3, \tilde{N}_4$ — dynamic specific radionuclide activities in the model's boxes, $\hat{E}_1, \hat{E}_2, \hat{E}_3$ — direct coefficients of radionuclide transfer between boxes, $\hat{E}_1^-, \hat{E}_2^-, \hat{E}_3^-$ — inverse coefficients. The dynamics of radionuclide activity in such a system is represented by the following system of differential equations:

$$\begin{aligned} \frac{dC_1}{dt} &= K_2^- C_2 - K_1 C_1, \\ \frac{dC_2}{dt} &= K_1^- C_1 - K_2 C_2 - K_2^- C_2 + K_3^- C_3, \\ \frac{dC_3}{dt} &= K_2 C_2 + K_4^- C_4 - K_3^- C_3 - K_3 C_3, \\ \frac{dC_4}{dt} &= K_3 C_3 - K_4^- C_4. \end{aligned} \tag{2}$$

If there is a constant inflow of radionuclides into the first box "soil", then another equation is added to the system:

$$\frac{dC_0}{dt} = K_0 C_0, \tag{3}$$

where C_0 is intensity of the radioactivity source at the moment of emission (Bq); K_0 — the coefficient of radionuclide transfer from the source to the first box. In this case, the first equation of the system is supplemented by one more term: $+\hat{E}_0\tilde{N}_0$. Practically for any complex and branched ecosystem, an appropriate system of equations can be compiled and solved (for example, we use the software MAPLE).

The method of box models is the simplest and adequate mathematical method for describing radioecological processes in ecosystems of various complexity [4].

The Concept of Reliability in Radiobiology of Multi-level Biological Systems

Biological objects have extremely high reliability, which greatly exceeds the reliability of any technical systems. This follows primarily from the time of the existence of biological systems, which significantly exceeds the time of failure-free existence of technical systems. As a definition of the concept of biosystems reliability, one can offer the following: the reliability is a fundamental property of biological objects which determines their effective existence and functioning in randomly varying environmental and time conditions. The degree of reliability is the probability of fail-safe existence of systems which can vary from 0 to 1.

Two main types of systems are distinguished in the mathematical theory of system reliability [5]. Let the reliability of a separate element of the system be determined by P_i — the probability of fault-free existence of the element.

The first and the simplest type of the system consisting of many elements is a system of sequential type. Mathematically, the reliability of such a sequential system with n-elements is determined by the formula of probabilities multiplication:

$$P_{\text{series}} = \prod_{i=1}^{n} P_i. \tag{4}$$

It is clear that such a consistent system has extremely low reliability since the failure of at least one element leads to the failure of the entire system. Even the high reliability of P_i elements cannot provide the high reliability of such a sequential multi-element system.

Another type of system is a parallel type system. Such systems can fail only when all their operating elements are in a state of failure. Almost all electrical networks in residential buildings, as well as in industry work according to this scheme.

If the failure probability of one of the elements is P_i, then the probability of failure-free existence will be equal to $1 - P_i$. In a parallel system, the elements work independently, therefore, according to the formula for multiplying

probabilities, the failure probability of all n-elements looks as follows:

$$P_{\text{system failure}} = \prod_{i=1}^{n} (1 - P_i)\,. \tag{5}$$

Then the probability of a failure-free existence of such a parallel system is determined by the formula:

$$P_{\text{parallel}} = 1 - \prod_{i=1}^{n} (1 - P_i)\,. \tag{6}$$

Obviously, a system built according to the parallel principles will be highly reliable even if the reliability of its individual elements is insignificant. Such a property of the parallel system lies at the heart of the reservation method, often used while creating highly reliable technical systems, and in the structure of existing biological systems [5–8].

Algorithm for calculating the reliability of ecological systems

The developed models and the theory of ecosystems radioactivity made it possible to introduce a radio capacity factor to determine the state of the ecosystem biota.

The factor of ecological and radiation capacity F_j for a given element of the landscape or ecosystem is defined as follows:

$$F_j = \sum a_{ij} \Big/ \Big(\sum a_{ij} + \sum a_{ji}\Big), \tag{7}$$

where $\sum a_{ij}$ — the sum of the rates of the pollutants transition from various components of the ecosystem to a specific element of the landscape or ecosystem according to box models, $\sum a_{ji}$ — the sum of the pollutants outflow rates from the investigated box J — to other conjugated parts of the ecosystem.

The algorithm for calculating the reliability of ecosystems consists of the following stages:

1) Constructing the box model of the ecosystem that is being studied.
2) Determining the radionuclide transition speed parameters (tracers — ^{137}Cs) between the boxes of the studied ecosystem.
3) In accordance with the formula (7), calculating the radio capacity parameters and reliability of each element of the studied ecosystem.
4) Determining the reliability of the studied ecosystem structure, which can be sequential, parallel or combined.
5) Defining the formula for calculating the overall reliability of the entire ecosystem on the basis of a reliable structure of this ecosystem.
6) Calculating the overall reliability of the entire ecosystem by formula (7) using the elements reliability parameters.

Thus, the method of structuring ecological systems includes four successive procedures:

1) the construction of a box radio-ecological model of the corresponding specific ecological system;
2) determination of its configuration (sequential, parallel or combined);
3) determination of parameters and rates of radionuclide transition;
4) calculation of the reliability of structural elements and the ecological system as a whole.

This method has been applied to modelling the transport of radionuclides and predicting their maintenance in systems for ecosystems "Forest", "place-Lake", "Marsh" and agroecosystems of varying complexity. [9–12].

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Concept, peculiarities of constitution and functions of civil society as a structural element of the modern world-system

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Abstract. The article proposes to look at civil society from the standpoint of Immanuel Wallerstein's world-systems analysis. Of course, Wallerstein can hardly be considered a theoretician of civil society. Still, his works can offer theoretical provisions that concern this topic as well. The article suggests the study of civil society as possibly the third structural element of the modern world-system, which, along with two other structural elements — the axial division of labor and the state and the system of interstate relations, — regulates social relations in it. It is shown that civil society consists of two dimensions: institutional and discursive. In general, features of creation and arrangement of each of these dimensions are characterized. The functions performed by civil society in the European capitalist world economy are highlighted.

Keywords: the modern world-system, civil society, the European capitalist world-economy, communicative action, Geoculture of the modern world-system, capitalist class, French Revolution, urban middle class, model of liberal state, surplus value, lower strata, ideology of liberalism

Анотація. У статті пропонується поглянути на громадянське суспільство з позицій світ-системного аналізу Іммануїла Валерстайна. Звичайно, Валерстайна навряд чи можна назвати теоретиком громадянського суспільства. Однак в його роботах наявні теоретичні положення, які стосуються й цієї тематики. У статті запропоновано потрактування громадянського суспільства як можливо третього структурного елементу модерної світ-системи, який, разом з двома іншими структурними елементами — осьовим поділом праці та державою і системою міждержавних відносин, — впорядковує соціальні відносини в ній. Показано, що громадянське суспільство складається з двох вимірів: інституційного та дискурсивного. У загальних рисах охарактеризовано особливості створення та влаштування кожного з цих вимірів. Виокремлено функції, що їх виконує громадянське суспільство в європейській капіталістичній світ-економіці.

Ключові слова: модерна світ-система, громадянське суспільство, європейська капіталістична світ-економіка, комунікативна дія, геокультура модерної світ-системи, капіталістичний клас, Французька революція, міський середній клас, модель ліберальної держави, додаткова вартість, нижча страта, ідеологія лібералізму.

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Introduction

This article is devoted to civil society as a subject of contemporary importance. This topic is widely developed in social sciences. Social scientists have created a number of theories of civil society, each of which offers its particular image. But many of such theories have one thing in common. Often civil society is considered in them as a structural element of a more general object — a modern society, — and depicted as emerging and developing within modern society. This feature is typical, for example, for the theory of civil society by Jürgen Habermas [19] or, for example, for Jeffrey Alexander's civil society theory [1] but also for other theories as well.

Immanuel Wallerstein in his world-systems analysis proposes a new object in the context of which social reality may be investigated. And this object is not a modern society, but — a world-system. Wallerstein distinguishes several types of world-systems that existed in certain historical periods. But the modern world-system the American scientist calls as the European capitalist world-economy. The world-systems approach creates new perspectives for interpreting the essence of civil society. Although it is difficult to consider Immanuel Wallerstein as a civil society theoretician, nonetheless, in his scientific studies, it is possible to distinguish theoretical provisions that concern this topic as well. They give grounds to consider civil society as a structural element of the European capitalist world-economy and from this angle to interpret peculiarities of its constitution and functions it performs. Such an interpretation can enrich knowledge about civil society developed in social sciences.

Accordingly, the purpose of this article is: based on the theoretical provisions of Immanuel Wallerstein's world-systems analysis, in general terms to outline the concept, peculiarities of constitution and functions of civil society as a structural element of the modern world-system. Considering the limited space, this article is rather fragmentary and schematic. The theoretical basis for this work is the world-systems analysis by Immanuel Wallerstein. However, it still lacks some specific conceptual-categorical instruments relating to the subject of civil society. Therefore, in order to reveal peculiarities of constitution of civil society as a structural element of the modern world-system, the concept of communicative action is used in the work. It is borrowed from the theory of communicative action by Jürgen Habermas, but it is used in the context of Wallerstein's world-systems analysis.

To reveal the subject of our study, the "structure — action" construction would come in handy. Structures organize social action, preventing it from unfolding in a random way. They channel, more or less firmly, social action in a certain direction, and do not let it steer away from the required course. Structures are historical formations. According to Wallerstein, they occur at a certain historical moment, develop for a more or less long period, and at some moment, they die out [13, 3].

This article consists of four points: 1) the first point summarizes the concept and main features of civil society as a structural element of modern society; this generalization is needed in order to depart from it and move to understand civil society in a world-systems perspective; 2) the second point employs certain provisions of Immanuel Wallerstein's world-systems analysis as the basis to show the peculiarities of creating the institutional dimension

of civil society; 3) the third point employs certain provisions of Immanuel Wallerstein's world-systems analysis and the concept of communicative action to review the features of the discursive dimension of civil society; 4) and finally, the fourth point deals with the peculiarities of inclusion of the lower strata of the modern world-system into civil society.

1. The concept and general features of civil society as a structural element of modern society

In social sciences, the essence of civil society is often contemplated within the confines of a territorially limited social unit termed as "modern society". Civil society constitutes a structural element of this unit, distinct from its other two basic structural elements, economy and the state. Each of the three is interpreted as an autonomous sphere developing according to its own inner logic. On the one hand, economy, the state and civil society confront each other, but on the other hand, they supplement each other in their functions, thus stabilizing each other and forming the "systemic frame" of modern society [1, 31–33].

Economy is considered as a sphere of economic action. Within its framework, purposive-rational economic relations are ordered to create and distribute surplus value, or wealth. The state represents a sphere of administrative action. It features purposive-rational relations concerning distribution and exercising of administrative powers. Civil society is interpreted as a sphere of communicative action. This is a domain of communicative relations — an open rational communication that has the purpose of achieving the mutual understanding or consensus about how to organize common, collective life based on universal principles of justice [9, 217–219; 10, 318–319].

Based on Nancy Fraser's work, we can distinguish the following features of civil society: it territorially coincides with legally defined boundaries of a certain modern society; as a result of communication, it produces public opinion addressed to the state that exercises sovereignty over this territory; the subjects of communication are members of a legally constituted political community — nation, i.e. citizens of the state who can join voluntary non-governmental and noncommercial associations, organizations and movements; every citizen has the same right to participate in communicative processes as other citizens; communication is implemented via national mass media, which connect territorially scattered participants with each other; communication requires the existence of a common linguistic medium: official language or several official languages [7, 10–12].

Civil society functions in a way that attracts attention to actions, events, states of affairs, etc. that, occurring in particular spheres of modern society, cause injustice. Citizens of the state "become outraged" and enter communicative networks of the public sphere to comprehensively discuss these actions, events and states of affairs in order to reach a consensus on the attitude to be displayed toward them and find the ways to fix the situation. As a result, civil society generates public opinion and uses it to put pressure upon administrative apparatus of the state and force the latter to adopt and carry out decisions aimed to restore justice. By participating in communicative processes

of producing public opinion, citizens of the state become convinced that they have real influence upon organization of social relations in particular social domains. Society becomes for them their own "lifeworld" that they constitute for themselves, and the feeling of belonging to the same national community becomes stronger among them, thus strengthening social solidarity.

When conceptualizing the nature of civil society, it is important to establish when it has emerged, where and why. To ascertain these aspects, the concept of "European civilization" or simply "Europe" is often used in social sciences to define a historical-cultural formation that creates a single general cultural context for countries of the geographical region of Western Europe. As Andre Gunder Frank showed, an explanatory scheme is developed, according to which, European civilization rises in Ancient Greece and then passes a number of historical eras or stages in its development: antiquity, Hellenic-Roman, medieval, Renaissance, and early and late modernity [6, 3].

According to this scheme, the origins of civil society are also rooted in Ancient Greece. At that stage, it is its "protoform". As European civilization has been developing, other protoforms of civil society have occurred in the context of subsequent eras. And only in era of early modernity did it begin to attain its present form. This explanatory scheme is often reproduced in works by social scientists. An example is works by the civil society historian John Ehrenberg [5] or the political scientists Steven DeLue and Timothy Dale [3]. The key factor that gave impetus to the emergence of civil society in early modern age was capitalism that was born at that time. The appearance of capitalism itself is also attributed to the cultural context of European civilization and traditionally explained, following Max Weber, by the effect of the ethics of ascetic Protestantism.

Speaking about particular countries of European civilization, civil society has first emerged in England and France in the 17^{th} century, because capitalism was beginning to spring up in these particular countries. The terms denoting the new communicative sphere were coined at that very time: English "civil society" and French "la société civile" [19, 46]. How does capitalism give rise to civil society? To ensure rational functioning, capitalism needs to institutionalize itself in the relevant social structures of the society. At the time of its birth, these were nonexistent in the "still-feudal" world of the 16^{th} — 17^{th} centuries. Therefore, having been born in England and France, capitalism set in motion modernization processes in the "traditional" societies of these countries. It caused rationalization and differentiation of these societies, and as a result, old feudal structures started to gradually come down and give way to new, separating from each other, basic structures necessary for the capitalist order: modern economy, the state and civil society. Social transformations in England and France continued for several hundreds of years, completing only in the mid-19^{th} century. A rational form of capitalism and the corresponding modern societies with differentiated economy, the state and civil society gained a firm foothold in these countries.

In other countries of European civilization, social changes were launched somewhat later, depending on when a particular country began to switch to the "capitalist footing". In Germany, for instance, it began in the 18^{th} century. And by the early 20^{th} century, in Max Weber's opinion, countries of Europe have completed the transition to rational capitalism and saw the rise of develo-

ped modern societies in their territory [18, 255]. The French Revolution played an important role in these processes by helping eliminate obsolete feudal social structures and entrench new, modern ones.

After modernization of European countries finished, capitalism began to be considered not a unique phenomenon rooted in the culture of European civilization but a universal factor of successful development. As Wallerstein shows, there was now a belief that it could be implemented in any place of the world, even if the required cultural context was absent there. All an undeveloped country had to do is to start the necessary reforms and begin developing a European-like capitalism, and that would immediately set in motion modernization processes resulting, at the end of the day, in the establishment in that country of a developed, rationalized modern society [13, xviii].

However, there were instances when in certain countries the processes of capitalist modernization were launched but then curbed at certain point, for one reason or another, or when their "catching-up" modernization had from the very beginning an alternative, "non-capitalist" character. In those instances, developing a rational capitalism is not possible. In the societies of these countries, the three base modern structures do seemingly appear, but their sufficient differentiation could not be achieved. There is often a situation when the state towers above the other two spheres, intruding on them and subordinating them to the logic of its development. Countries like that see the establishment of a nondemocratic (e.g. authoritarian or totalitarian) political regime. Private sector-driven market economy begins to degenerate, and the functioning of civil society is defined and controlled by the state, which is manifested, in particular, in the control by the state of the topics for communication and of the arguments that should be used in that communication.

If a country begins transition to capitalism and moves toward development of the necessary social structures but transformations have not been completed yet, there might be another situation in which the economy towers above the other base spheres of action and subordinates them to the logic of its development. Under these conditions, the country sees the establishment of a not-quite-rational form of capitalism, the so-called "wild capitalism". The state is reduced to the minimum, performing only the limited functions of a "nightwatch". Communication in the civil society domain becomes fragmentary and reified under the pressure from an uncontrolled and unregulated market, and the mechanisms for communicative producing of public opinion fall apart. In both cases of insufficient differentiation — when either the state or economy dominates over the other two spheres — civil society cannot be considered sophisticated. Free rational communication in it degrades, the possibility of achieving mutual understanding in a communicative way becomes more difficult, and social solidarity weakens.

Immanuel Wallerstein proposes orientation not toward the modern society but toward a more global object — world-system. The scholar calls the modern world-system a European capitalist world-economy. It has emerged in Europe during the "long 16^{th} century", went through several waves of territorial enlargement since then, and eventually, encompassed the entire world. A world-economy has many political units and cultures within it, and daily life of people in it is substantially different, but at the same time, it remains an integral formation knit on the basis of single economy. The underlying sys-

temic principle for development of the world-economy is infinite accumulation of capital [17, 85–86].

A world-economy consists of two structures. The first is the axial division of labor. According to Wallerstein, it contains three production regions characterized by an uneven degree of development: core, semiperiphery and periphery. The axial division of labor orders economic action within a world-economy. The production region of periphery creates conditions for directing economic action into the channel of producing raw materials with low surplus value, while in the core region, it is directed into manufacture of industrial high-tech products with high surplus value. In this respect, the semiperiphery occupies an interim place between the other two. After exchanging the core's industrial high-tech products for the periphery's raw materials, surplus value flows, with intermediation of the semiperiphery's "conveyor belts", to the core and accumulates there. That's how the mechanism of exploitation by core countries of the workforce and raw materials of periphery countries is formed, with simultaneous strengthening of the latter's underdevelopment [13, 86–87, 116, 219].

The other structure of a world-economy is represented by states and interstate blocs where administrative action takes place. Core countries have strong states that maintain the domination of the core over the periphery. They facilitate uneven redistribution of surplus value among production regions. At the same time, core states wage a continuous struggle among them for the right to exploit the periphery and control the semiperiphery. Peripheral countries have weak states that have little to confront "core" states with. Their role is being reduced to the balancing of the local budget and maintaining social order in the territory they control. Based on these two structures, elites of "core" states become able to appropriate the overwhelming proportion of surplus value produced in a world-economy [14, 113–116].

Considering peculiarities of the constitution of the modern world-system, Wallerstein is talking only about two structures of that system: 1) axial division of labor and 2) modern states and interstate system. Still, the world-systems analysis of the American scholar contains theoretical provisions that give reasons to think about whether civil society can be considered the third structure of a world-economy. According to its definition, civil society is a sphere in which communicative action is institutionalized. And if it indeed is the third structure of the modern world-system, communicative action in it must be institutionalized in a way that does not contradict the logic of the world-economy's development: communication in civil society must promote, directly or indirectly, infinite accumulation of capital.

Wallerstein's approach may have some consequences for the interpretation of historical development of civil society. The concept of "European capitalist world-economy" is ill-aligned with the concept of "European civilization". If we are to imagine social world as a world-economy, then, firstly, it would be economy that brings social world's components into a single whole, not a single cultural context. And secondly, the beginning of this world is dated to the "long 16^{th} century" and not earlier. Social worlds that existed in the geographical region of Europe before the appearance of the world-economy can be regarded as other, distinct historical systems rather than development phases of the single whole called "European civilization". Therefore the view claiming that

civil society is inalienably related to the development of "European civilization" and traces its origins to Ancient Greece does not look convincing.

On the other hand, the concept of "European civilization" does not take into account development specifics of communicative sphere in other regions of the world. There are studies showing that, for example, in Imperial China under the Ming and Qing dynasties, this sphere was more developed than in contemporary Europe. For instance, Karla Simon [11], Michael Edwards [4, 255], Kathryn Bernhardt, Philip Huang and other scholars [2] describe not only a great diversity of voluntary organizations in Chinese cities, such as public hospitals, market associations, cultural groups, public homes for the elderly, etc. that were cared for by the townspeople themselves, but also the existence of elements of the legal system that regulated their activity. In all likelihood, communicative relations existing in the public space between economy and the state can be found in any developed historical system; they just take a different shape in each of them. One can assume that in the modern world-system, they take the shape of civil society.

The other consequence is reinterpretation of the reasons for the emergence of civil society. In his world-systems analysis, Wallerstein shows that capitalism is an attribute of a world-economy, not of particular units that form it. A world-economy is what's capitalistic, not the countries existing within it. What we can say about these countries is that they are, for instance, more developed or less developed, depending on the place each of them occupies in the axial division of labor: in the production region of core, semiperiphery or periphery. Capitalism cannot be built in a separate country, and therefore, it cannot be a factor directly responsible for the appearance of modern society in a particular country, of which civil society is an inalienable structural element. If we are to adhere to this view, sophistication or unsophistication of civil society in a particular country should be explained by other factors.

From the standpoint of Wallerstein's world-systems analysis, the answers to the questions of the time, place and reasons for emergence of civil society become more precise. A modern civil society has emerged between 1789 and 1848 in core states of the modern world-system. Since the world-economy emerge during the "long 16^{th} century" and civil society has appeared in the late 18^{th} — early 19^{th} century, it appears that the world-economy has successfully existed without this structure for almost three hundred years and did not need it for its development. Why then has civil society emerged, after all? An indirect cause was, of course, development of the European capitalist world-economy, but the event directly responsible for its emergence was the French Revolution.

In social sciences, civil society can be considered consisting of two interrelated dimensions: institutional and discursive. This approach is employed, for instance, by Jeffrey Alexander [1, 69]. The institutional dimension is related to social institutes that create conditions for deployment of open communication in the society, while the discursive dimension to the cultural knowledge, codes and symbols used directly during communication. When taking a look at civil society from the standpoint of world-systems analysis, this approach can be used as the basis to describe its constitution. But now, the specific features of both the institutional and discursive dimensions would be interpreted somewhat differently.

2. The French Revolution and the establishment of the institutional dimension of civil society

The French Revolution was, undoubtedly, an event that significantly changed today's world. Social sciences offer enough explanations of its meaning, causes and effects. A distinguishable feature of Immanuel Wallerstein's version is the consideration of the French Revolution in the context of development of the modern world-system. As follows from the very definition of the European capitalist world-economy, the French Revolution could not, by its very essence, be "bourgeois" in the sense that it caused, or at least accelerated, the transition from feudalism to capitalism, because at the time it broke out, capitalism has been successfully functioning for quite a while.

Randall Collins showed that thanks to the efforts from Theda Skocpol, Charles Tilly, Jack Goldstone and other scholars, an explanatory model has been developed, citing intra-elite conflict that results in a collapse of the state as the main reason for modern revolutions. According to this model, a revolution always starts "on the top", among the elite. In order for it to happen, two key factors must coincide. The first is fiscal crisis of the state: the state finds itself in a situation when it is no longer able to pay foreign debt or finance its own army, police and security forces. Fiscal crisis is often caused by military reasons: exuberant military expenditures and battlefield defeats. However, it becomes fatal when combined with the other factor — a split among the elite as regards the way out of the difficult situation. When an intra-elite conflict escalates to the point when any agreements and at least the minimal consensus become impossible, the state machinery becomes paralyzed and the monopoly for the legitimate use of force falls apart. That opens the door to the spontaneous popular uprising and the overthrow of the ruling regime [12, 57–58].

Overall, Wallerstein's description of the French Revolution fits into the aforementioned model. However, the context of the modern world-system is added. A world-economy is developing in a way that, on the one hand, it goes through a number of economic upturns and downturns explained by Kondratyev's theory of long cycles, and on the other hand, hegemon states appear within it from time to time. The latter play an important role in its development, being capable of ensuring relative stability and order in a world-economy, but their hegemony does not last long. When a hegemon steps down, a fight for the vacant position ensues. From that moment on, the order in a world-economy becomes shaky. A long period of disorder and turbulence begins, featuring protracted world wars.

According to Wallerstein, after the United Provinces of the Netherlands lost the status of hegemon in 1675 the struggle between Great Britain and France for hegemony began, culminating in the Seven Years' War. France was defeated in that war, which essentially meant losing the struggle. And in the early 19^{th} century, Great Britain became a hegemon state of the modern world-system. For France, the consequences of the defeat were severe. Its position in the world-economy became worse. The loss of key colonies combined with large military expenditures undermined France's financial strength. The balance between revenues and expenditures was upset, and the country was forced to borrow more and, thus increasing its sovereign debt. As of 1788, the costs of

servicing sovereign debt have reached 50% of the country's budget, and the state has found itself on the verge of bankruptcy [15, 84–85].

Wallerstein shows that in the early 1770s, French elites (although the American scholar was talking mostly about the capitalist class, attaching somewhat lesser significance to other elite groups) began to look for ways to improve the difficult financial situation. Two competing options have been proposed. Capitalists-manufacturers saw the most effective solution in the substantial increase of taxes levied upon agricultural enterprises of capitalists-landowners. These taxes were traditionally low, for the latter enjoyed tax benefits guaranteed by their nobility status. On the other hand, capitalists-landowners opposed the implementation of any mechanisms that could redistribute their profits in favor of the state. They saw the way out of crisis in liberalization of trade. Capitalists-landowners have managed to lobby a trade agreement with Britain, signed in 1786. According to that agreement, France opened its domestic market to British industrial goods, while Britain opened its market to French agricultural products. They hoped to replenish public finances with customs receipts from duties levied upon imported industrial goods. However, no substantial improvement of financial situation could be achieved [15, 86–88].

Instead, the position of capitalists-manufacturers has worsened as they have been squeezed out by British competitors from not only foreign markets but even France's domestic market. Capitalists-manufacturers were unceasingly pressuring the state, demanding drastic measures: promoting stronger their interests within the world-economy, substantially enlarging the tax base, erecting customs barriers to protect local manufacture and trade against foreign competition. On the contrary, capitalists-landowners opposed restrictive economic and trade measures and measures aimed to strengthen the state, rejecting the raise of taxes and insisting upon continuing liberalization. They have even been seriously thinking about the option of rolling France back to the semiperiphery, considering the possibility of the country's partial deindustrialization [15, 89–92].

By 1789, France's public finances have reached the critical condition. Yet, no program of getting out of this situation could be developed. At some moment, exasperated by acute fiscal crisis, the intra-elite conflict has reached the highest point of escalation. The state became dysfunctional. The mechanisms of the legitimate use of force malfunctioned, and a vacuum of power has appeared in the society. The dam was destroyed, and the waves of broad masses poured into the breach — a revolution in France has begun. And the rising masses of people — the lower strata and urban middle class — appear at the historical stage.

The broad masses have directed their revolutionary energy toward radical redistribution of surplus value in their favor. The masses wanted to destroy the world-economy's structures and mechanisms that made infinite accumulation of capital possible. Therefore, Wallerstein believes, the French Revolution had an anti-system, not "bourgeois" nature. Since the explosion has occurred in a key core state, the legitimacy of the world-economy faltered and revolutionary uprisings began spreading over the countries of both the core and other production regions.

In the course of the French Revolution, the rising masses demanded to shift the locus of sovereignty from the monarch to the people. In practice, that meant transformation of the state from an absolute monarchy to a popular democracy. If these demands were met, the broad masses would have received control over the state and, along with it, real instruments for redistribution of surplus value, while the capitalist class would have lost both the power and the possibility to continue accumulating capital infinitely. On the one hand, the capitalist class had to heed to demands of the rising people. But on the other hand, they could not allow the establishment of a popular state. To find the way out of this problematic situation, the capitalist class had, Wallerstein believes, to show wits and inventiveness. They had to design a model of the state that would appear popular at first glance while not actually being such, but even then enjoying support from a substantial part of the population, and the establishment of such a state would have calmed down the revolutionarily-spirited population. The historical solution was to create the model of liberal state, which eventually replaced the absolute monarchy [16, 23].

The arguments cited by Wallerstein give reasons to assume that the model of liberal state envisages the establishment of not only a modern liberal state allegedly facing the people but also civil society. Open communication in the sphere of civil society enabled the public to legally exert influence over the state, compelling the latter to take certain measures. On its part, the state was becoming accountable to civil society, orienting toward its demands; decisions made by the state had to conform to the will of the people. This was the scheme through which the "popular" nature of the new model of state had to be realized. But in fact, this model made possible only a limited participation in the discussion of a quite narrow range of local matters. The implementation of this model did not change the position of the capitalist class and did not alter the fundamental principles on which a world-economy is developing. Still, it did receive the support from the people, or at least from their key part, urban middle class.

The establishment of a new model of state began with constitutional and electoral reforms in core states. The adoption of constitutions limited the monarch's powers, while enfranchisement of the people enabled them to elect legislative bodies of the state. The next step was introduction of broad civil rights. The equality before law, freedom of movement and choice, freedom of speech, expression, conscience, religion and belief, freedom of association and freedom of information — all these liberties made possible public discussion of contemporary political, economic and other matters. Reforms led to the creation of the foundation for the model of liberal state — the nation of citizens.

The establishment of the model of liberal state was accompanied by the de-facto constitution of civil society's institutional dimension, which became the foundation for open public communication. A number of civil society institutes can be named. The first important institute is public opinion, the production of which was legally enabled and legislatively regulated. The second institute is, probably, the liberal state, which is subjected to communicative pressure from public opinion and must react to it. A modern civil society could hardly be able to function without the existence of a liberal state. Free and independent mass media enabling communications to circulate across the entire society and expanding the public sphere should be included to civil society

institutes as well. The system of civil rights, and especially the right to vote, is also worth mentioning. Perhaps, it makes sense to include to civil society institutes voluntary associations, organizations, parties, etc. legally established by citizens and legislatively regulated.

Development of the new model was distinguishable for the fact that at first, electoral and civil rights have been unequally granted to the urban middle class and the lower strata. Emmanuel-Joseph Sieyès proposed to differentiate between "active" and "passive" citizens. In his opinion, all people living in the country had to have the right to life, the right to protection of their person and property, the right to freedom. However, not everyone should have the right to form bodies of public administration and participate in open communication in the civil society sphere, i.e. not all are "active" citizens. According to Sieyès's terminology, only representatives of the urban middle class have the status of "active" citizens [16, 145].

Having gained the right to vote and the right to legally participate in communicative processes of producing public opinion, the urban middle class became confident that they really have influence upon organization of social life and that they do determine the direction of its development. They abandoned revolutionary practice, making themselves comfortable within the new socio-political order of "modern society". After that, uprisings of the lower strata lost their edge and no longer posed a serious threat. Without network and organizational resources of the urban middle class, anti-system rebellions of the lower strata had little chances to succeed. The only thing left for the lower strata was to be content with the questionable status of "passive" citizens [16, 73–75].

According to Wallerstein, the establishment of the model of liberal state in three core countries of the European capitalist world-economy: Britain, France and Belgium, was completed in 1830–1832 [16, 74–75]. The urban middle class became the main adept and support of this model. At first, only representatives of this class were included to civil society as full members or participants. The model of liberal state provided structural stability to the modern world-system and restored its lost legitimacy. The new model became a template for political changes, and over time, it was implemented, to a greater or lesser degree of success, everywhere within the modern world-system.

3. Geoculture of the modern world-system and the discursive dimension of civil society

The creation of institutional dimension enabled to organize and to order circulation of public communication streams in society. However, the institutes themselves were not enough. In order to establish communication, the very communication between citizens must be channeled in a certain direction. For that purpose, the second — discursive — dimension of civil society must be constituted in a special manner. Any communication is based on a language, and language, in turn, is deeply interwoven into the cultural environment of a community and is formed in it. Therefore, the discursive dimension of civil society requires the existence of a special language of communication and the relevant cultural context. Wallerstein's world-systems analysis does not have

enough instruments that could be used to study the discursive dimension, but Jürgen Habermas's theory of communicative action does — it's the concept of communicative action. It can be used to perceive the discursive dimension of civil society while adhering to the world-systems view at social reality.

Jürgen Habermas has developed the notion of communicative action to cognize the domains of social reality that Max Weber's attention missed. Habermas understands communicative action as a special type of social action. It is realized in a dialogue and takes the form of linguistic utterances in which the actors or participants of dialogue are trying to reach mutual understanding as regards something in the world and coordinate their behavior on that basis. Acting communicatively, every participant offers an own vision of the problematic situation being discussed, criticizes the vision of others and defends his own vision against objective criticism, and that goes on until all actors arrive at the common definition of situation. In communicative action, mutual understanding is achieved on the basis of rational argumentation: a participant may drop his own interpretations and accept interpretations proposed by others not because of external coercion but voluntarily, yielding to the power of better arguments [9, 10–13].

When trying to reach mutual understanding, actors always assume relation to something in the world. Habermas offers a decentered understanding of the world, dividing it into three formal domains: objective world of existing states of affairs, social world of the community of which the participants of dialogue are members, and subjective world to which only one person has privileged access. Acting communicatively, actors may refer in their utterances to things from one or another world: to objective facts of nature, to social norms and values of the community, or to their own subjective experiences. The three worlds distinguished by Habermas represent differentiated segments of the knowledge used in communication [9, 52].

If, during communication, an actor assumes relation to the objective world, his communication is represented, according to Habermas, by constative utterances in which he refers to facts and represents the existing state of affairs. An actor states something about the physical world of nature, and is able to defend the truthfulness of his utterances in the light of objective criticism. Truth becomes the criterion for evaluation of utterances: other actors may accept or decline a statement on the basis of whether or not it represents the true state of affairs. If an actor assumes relation to the social world of the community whose member he is, his communication would then be represented by regulative utterances. In these utterances, he refers to social norms and values and establishes interpersonal relationships with other members of the community. An actor puts forth the imperatives regarding how others should conduct themselves, or defends the conformity of his own behavior with the community's legitimate norms. In that case, normative rightness becomes the criterion for evaluation of utterances. And finally, if an actor assumes relation to his own subjective world, he makes expressive statements referring to his personal subjective experiences and presents his self to others. An actor is trying to create a certain image of himself in eyes of the public by randomly revealing his own subjectivity. The criterion for evaluation of utterances in this case is sincerity [9, 85–88, 90–93].

According to Habermas, communicative action envisages language as a medium for free communication, in which actors simultaneously refer in their linguistic utterances to things in the objective, social and subjective worlds in order to establish a common definition of the situation and reach mutual understanding this way. Acting communicatively, actors integrate the three worlds into a single coordinate system that provides them with the knowledge for interpretations. They simultaneously refer to objective facts, social norms and values, and subjective experiences and mutually put forth validity claims for the truth, normative rightness and sincerity. Ideally, communication should produce an inter-subjective meaning of the world that is the same for all participants [9, 93–95].

The social world plays an important role in the daily communication practice. In their interpersonal relationships, actors continuously face problematic and often conflict situations that require resolution. The resolution takes place via the reference to the social norms and values legitimate for the particular community. If actors assume relation to the social world in daily communication, their communication may be channeled into two different discourses. Habermas calls the first of them a "discourse of application". In it, the participants of communication refer to social (in particular, moral) norms without thematizing them [8, 67–68].

The second discourse unfolds in a situation when actors thematize and discuss the norms per se, trying to arrive at the common understanding of these norms or to establish new norms. In that case, actors refer in their arguments to the social values that are significant for the community. Interpreting, establishing or abolishing a particular (including legal) norm is possible on the basis of values. The latter lay at the core of social norms that regulate daily behavior in the social environment. Habermas calls this discourse a "discourse of justification". It is important that values must be internalized by every member of the community and transformed into internal structures of his conscience. A communicative establishment, interpretation or abolition of a norm within the "discourse of justification" may be possible only under this condition, and a proposal to act in accordance with a particular social norm as part of the "discourse of application" will not be construed as external coercion [8, 67–68].

Communicative always occurs in the horizon of lifeworld. Daily communicative practice takes place against the background of lifeworld, and in turn, lifeworld is reproduced via interpersonal communication. One cannot exist separately from the other. Habermas understands lifeworld as the context for the processes of achieving mutual understanding, as the background for thematizing and discussing particular problematic situations in daily life. The German scholar distinguishes three structural components of lifeworld, terming them as "culture", "society" and "personality". For Habermas, "culture" means the stock of knowledge from which participants of communication draw interpretations; "society" means legitimate orders through which the participants regulate their membership in a social community and reproduce social solidarity; and "personality" means competencies enabling the subject to speak and act, i.e. enabling him to participate in the processes of achieving mutual understanding [10, 135–138].

Since civil society is defined as an institutionalized sphere of communicative action communication in civil society takes place according to the rules of that action. Citizens of the state communicate in order to achieve mutual understanding on the basis of rational argumentation. They broadly use the knowledge from all three worlds, referring in their utterances to facts, social norms and values, and subjective experiences, mutually raising validity claims for the truth, normative rightness and sincerity. However, civil society is a special sphere. Communication in it is somewhat different from the one taking place in ordinary daily life. In civil society, the purpose of communication is to achieve understanding regarding not simply narrow, limited "routine" problematic situations but also bigger matters — the matters of rational, correct organization of society in general and its certain domains in particular. Therefore, relation to the social world and the use of appropriate knowledge play the key role in this respect. But the very stock of that value-based normative knowledge to which citizens could refer must be special.

On the other hand, the model of liberal state was designed to become implementable in any core, semiperipheral or peripheral state. This model became standard, or template, for countries of the modern world-system after the French Revolution. Since civil society is established along with the establishment of a liberal state, it must be standard, too. It must be characterized by the same attributes, regardless of the world-economy country in which it occurs. It means that besides standard social institutes, the value-based normative stock of knowledge or, in Habermas's words, the component of lifeworld called "society", must the same everywhere, too. No matter what production region of the modern world-system a country is located in, no matter what its cultural specifics are, what language its people speak and what religion they follow, but if this country adopts the model of liberal state, it must see the establishment of a standard value-based normative cultural context that enables standard communication in the civil society domain. And first of all, we are talking about the uniform set of values that must be internalized by the country's people.

It appears that Geoculture of the modern world-system was responsible for ensuring such a uniform value-based normative filling of the discursive dimension. It created the same stock of knowledge about the social world, or "society" component of lifeworld, for civil societies of any country of a world-economy adopting the model of liberal state. In Wallerstein's opinion, Geoculture of the modern world-system is the ideology of liberalism. It shaped itself up in the course of the French Revolution, and has finally gained foothold before 1848. Geoculture contains a system of values that are essentially ideological. They include, first of all, freedom, equality and justice, and a number of other, derivative values, in particular, tolerance, dignity, individual autonomy, development of human abilities, etc. Geoculture of the modern world-system enabled to transcend cultural and religious specifics of the population of any country and create in that country, along with the relevant social institutes, a standardized, modern rational community: civil society.

Regardless of what matters of the society's constitution citizens were trying to reach understanding on in the public sphere, they would refer in their expressions to the standard set of values of the "common social world".

It results in relative standardization of communication itself. It becomes sufficiently defined or canalized, flowing in a more or less defined direction. The channeling of communication also manifests itself in the fact that a person referring to alternative values may be labeled "uncivil" and, in the best-case scenario, pushed back to the "periphery" of civil society or, in the worst case, expelled from it. When communication concerning the constitution of society takes place, a predetermined set of values helps build, regardless of the region of a world-economy, approximately the same image of a properly-organized rational society: open, just, equal, etc. It must be oriented at in civil communication. The actually existing societies are still far from this image, so they have to be "approximated" to that image on the basis of civic engagement and activity.

Geoculture of the European capitalist world-economy enabled to standardize communication in the civil society domain, bringing communication to a "common denominator". So now, public communication in civil society of any country of the modern world-system was taking place in a more or less the same way, according to the same rules. Overall, the establishment of the model of liberal state convinced the urban middle class that they have received real control over the state and the ability to influence decisions the state makes. They were assured that they now have an efficient instrument of improving the existing, still imperfect society.

From now on, any injustice, any "defects" in the society could be fixed peacefully, via open public communication in civil society, by producing public opinion as a result of communication and exerting pressure upon the liberal state. It seemed that one of the important postulates of liberalism, spoken about by such thinkers as John Locke, James Harrington and Immanuel Kant, has finally been put into practice: a nation of citizens is able themselves to set the course of development of their society via open, public communication and via broad use of "communicative reason"; a nation is able to gradually direct the society, step by step, toward a more developed, ordered, rational state. To be sure, that would require a relatively long time to accomplish. Instant changes are impossible. But in a distant future, a society guided by the will of its citizens would definitely become more and more just and rational. Radical, revolutionary methods of social changes are not only inappropriate and irrelevant but also dangerous and harmful. Looking from the angle of Wallerstein's world-systems analysis, it appears that the construction "liberal state — civil society" has become a sort of a mechanism used by the elites of the modern world-system's core states to suppress anti-system rebellions of the lower strata via limited engagement of the urban middle class in political administration processes.

4. Peculiarities of inclusion of the lower strata of the European capitalist world-economy into civil society

In the course of revolutionary events, the urban middle class and the lower strata fought together to overthrow the absolute monarchy. However, their union broke up after adoption of the model of liberal state. The new model did not quite conform to interests of the lower strata — they wanted more radical

transformations. But the urban middle class believed that the main goal of revolutionary movement had been achieved, and blocked further development of anti-system rebellions. The model of liberal state became a reality of life, so the lower strata had to get used to it. However, the urban middle class began to oppose the broadening of electoral and civil rights: having achieved full membership in civil society, they looked for the ways of not letting the lower strata in it. In that respect, their interests coincided with interests of the capitalist class of the modern world-system, who also could not accept the idea of political participation of the lower strata.

The problem was how to justify the exclusion of the lower classes without contradicting ideological achievements of the French Revolution: the principles of freedom, equality and justice. Immanuel Wallerstein shows that a special criterion was applied to justify the exclusion of the lower strata, the so-called "reason" criterion [16, 7]. The ability to act reasonably was named the key condition for participation in communication in the civil society sphere. Only if the participation is limited to those who have this ability would the communicatively achieved agreement regarding the ways of correctly organizing social life become possible. But who should be considered "reasonable", or worthy to partake in civil communication?

Jeffrey Alexander notes two polar discourses appearing in the communicative field of civil society: "discourse of liberty" and "discourse of repression", based on the system of binary symbolic codes. If a social group is constituted in positive symbolic codes of the "discourse of liberty", its representatives are depicted as having the qualities required for participation in communicative processes of producing public opinion: they are rational and critical, and do not require strong "leaders" and do not submit to authoritativeness; they are autonomous, abiding by law not because of external sanctions but because law expresses their natural rationality; they make themselves clear and do not conceal their ideas; they are open and benevolent to other members of a social community, etc. Representatives of this group do meet the criterion of "reason", and therefore, can be included into civil society [1, 56–59, 60–61]. At first, only the representatives of the urban middle class were depicted in positive symbolic codes of the "discourse of liberty". Only they were considered sufficiently competent to partake in open public communication in the modern civil society.

The "discourse of repression" refers to "uncivil" qualities. If a social group is constituted in negative symbolic codes of the "discourse of repression", its representatives are depicted as threatening the existence of civil society. They are unable to make rational judgments and critically perceive information; they cannot tell truth from lies, and therefore, they are easy to manipulate; these people are dishonest, inclined to recognize the authority and thoughtlessly submit to it, etc. The representatives of this group do not meet the criterion of "reason", and therefore, must be excluded from civil society [1, 56–59, 60–61]. The lower strata was immediately placed under the "discourse of repression", in particular, the following three social groups: working class, women and the Blacks. The representatives of these groups were considered incompetent in the sense of the ability to participate in civil communication. Since they are hardly able to make a rational contribution to discussions concerning matters

of contemporary importance for the community, particularly those concerning its rational constitution, they must be denied the membership in a modern civil society. Therefore, the model of liberal state envisaged from the very beginning that only a small fraction of people — white educated wealthy males — have the right to engage in open public communication.

After the establishment of modern civil society, social movements of those excluded from it began to appear in it. Worker movements, feminist and suffragist movements, movements of the Blacks oriented toward the use of communicative institutes of civil society in order to depict their social groups in positive symbolic codes of the "discourse of liberty" and substantiate on this basis the legality of their inclusion and the need for it. On the other hand, the dominant social groups — capitalist class and the urban middle class — wanted to apply the "discourse of repression" to the representatives of the lower strata in order to deny their access to the newly-established communicative sphere. Therefore, a lengthy symbolic struggle for the inclusion was waged in the discursive field of civil society.

Over time, main social movements would achieve success and "fade away". At least in core and semiperipheral states, the lower strata have eventually gained the electoral and broad civil rights: working class earlier, women and the Blacks later. But that did not significantly change their position in the capitalist world-economy. The lower strata were unable to achieve a substantial redistribution of surplus value in their favor, but only a partial one, based on mechanisms of the so-called "welfare state"; nor were they able to shake the power of the capitalist class. Instead, their rebellious energy was redirected from anti-system revolutions into the channel of struggle for the inclusion into civil society, thus being exhausted. And the integration of lower strata into national societies helped strengthen social solidarity, thus strengthening core states even more. The model of liberal state has been successfully functioning for a century and a half, and the first crisis has occurred in 1968.

An important function of civil society should be mentioned here. Civil society is a sphere where via rational communication meanings are produced. This function was discussed as by Jürgen Habermas, as by other scholars as well. In particular, it was described in Ralf Dahrendorf's works. This scholar says that in the modern era, people need deep cultural ties, the existence of which would give meaning to the world. These ties bind societies together, keep them in unity. Dahrendorf terms them as "ligatures". Without them, there is a danger to go down into the state of anomy. In Dahrendorf's opinion, civil society is the most important structure in society where "ligatures" are produced. Using civil communication, people provide themselves with semantic benchmarks in order not to feel themselves hapless in the ever-changing, unstable modern world [20, 32–36].

An assumption can be made from the standpoint of world-systems analysis that civil society of every country that adopted the model of liberal state produces more or less the same semantic benchmarks. In other words, communication in civil society gives the European capitalist world-economy uniform meanings. In particular, they help its residents reconcile with the injustice of social reality. These meanings are essentially ideological. They work well in core states, while their certain artificiality may be felt in peripheral states.

But overall, they serve their purpose. Max Weber says that in the 16^{th} — 17^{th} centuries, Protestant ethics that promised eternal bliss in the afterworld helped the lower strata reconcile with their dismal fate and quietly bear the burden of exploitation. In the 19^{th} — 20^{th} centuries, the full-fledged inclusion of the lower strata into civil society and active communicative participation in it brought the hope that a more just social order could be created in the future with the efforts of the citizens themselves.

Immanuel Wallerstein forecasts that approximately in the mid-21^{st} century, the European capitalist world-economy will cease to exist. The capitalist mode of accumulation of wealth, based on the axial division of labor, will exhaust itself. It is going to cause crisis of the other two structures, modern state and civil society. The ideology of liberalism will probably lose the status of Geoculture. It will become clear that social deficiencies of society could hardly be gradually fixed via rational communication. The fundamental issue of fair redistribution of surplus value may again take the center stage. A crisis of civil society, coupled with the decline of Geoculture of the modern world-system, may produce the situation of the lack of "ligatures" in which the "world" can lose sense. People may start looking for other mechanisms of producing meanings and for other cultural sources required for that purpose. Perhaps the first and the simplest thing in this situation would be to turn to religion. One of the possible ways out of the state of the "lack of meaning" could be rollback to religious fundamentalism.

A new world-system will rise in the place of the European capitalist world-economy. The mode of producing wealth and the mode of its appropriation by elites will probably change. The economy and the state will probably be organized somewhat differently. In that case, civil society may undergo transformation as well. The very communication in public space will not disappear, especially considering that information technologies would enlarge the public sphere like never before. However, both the institutional and the discursive dimensions of civil society may undergo some changes. Public communication may be ordered somewhat differently.

Conclusions

1. Modern civil society as the third structural element of the modern world-system appears in the context of political changes — changes caused by the French Revolution. It emerges along with the model of liberal state. Establishing of civil society made it possible to organize and to canalize in a definite direction a public open communication in the European capitalist world-economy.

2. Communication in public space outside the scope of the state and economy took place before the French Revolution as well, and it was typical for not just European countries but also, for instance, developed world-empires of East Asia. But only after the French Revolution have the necessary social institutes and the necessary value-based normative cultural context been created in the modern world-system, shaping public communication in the form of fundamental practices of modern civil society.

3. Civil society is often considered an entity confronting the state and trying by all means to limit its authoritarian tendencies. At the same time, civil society needs the state for its normal functioning. But it must be a liberal state, not, say, an absolutist state. Civil society and a modern liberal state need each other and could hardly function separately from each other.

4. The growth of civil society enabled to redirect the rebellious energy of the broad masses from anti-system revolutions into the peaceful channel of civil communication. At the same time, the functioning of the European capitalist world-economy was not seriously disrupted. The very communication in civil society was strictly regulated and canalized in that direction and not in another.

5. Civil society is a controversial entity. On the one hand, its functioning enables citizens to influence the organization of their collective life; but on the other hand, its creation rather makes an impression of the possibility to exert influence, in the sense that it is limited by territorial borders of a national state. However, the processes taking place in the world-economy at the supranational level and having indirect, or even direct impact on life of the citizens, remain beyond their influence.

6. The urban middle class was the social group that benefited the most from the advent of civil society. The creation of a new communicative sphere was very much in their interests. Unlike the lower strata, they were not interested in more radical political changes. Therefore, anti-system rebellions of the lower strata were transformed into liberal or national bourgeois revolutions largely thanks to the efforts of the urban middle class.

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Multiprofessional approach to emotionally developing environment for children suffered from the armed conflict

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Abstract. The article concerns the current problem of protecting the younger generation from the negative psycho-emotional impact of armed and military conflicts that are currently occurring, with a certain periodicity, in different countries of the world. Our work is based on the researches of foreign and domestic scholars who studed various aspects of the mentioned problem and on our own experience of communicating with people and directly children living in the zone of armed conflict that is occurring in the east of Ukraine. For this category of children typical are violations in psycho-emotional (increased level of anxiety, fears, emotional discomfort, etc.), intellectual and social development (complications of social adaptation, difficulties in communicating and establishing contact with others, etc.). Empirical studies prove that work with such children requires multiprofessional approach, namely, the interaction of educators of preschool educational institutions and practical psychologists, which will allow the complex approach to the problem of psycho-emotional protection of preschoolers who have been affected by the armed conflict. According to the authors, an important condition that will allow to solve this problem is the creation of an emotionally developing environment in an educational institution, which includes the emotionally positive atmosphere and emotionogenicity of the educational process, emotional relationships between the subjects of interaction (preschool teacher, psychologist, children), children's activity, which contributes to the development of the emotional sphere, getting the experience of positive attitude to the surrounding world, emotional well-being and comfort of preschoolers. The article substantiates the directions of creating an emotionally developmental environment in the process of interaction between the educator and the psychologist: emotionally developing, emotionally supporting, emotionally adjusting, emotionally activating, emotionally preventing, emotionally correcting, and the forms of their introduction into the practice of preschool educational institutions are given.

Keywords: Preschool children, children who suffered from a armed conflict, refugee children, the interaction of a preschool teacher and a psychologist, an emotionally developing environment, emotional well-being, emotional comfort, emotional upbringing

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Introduction

The negative impact of events taking place in the east of Ukraine is traced in all spheres of vital activity of citizens: loss of housing, loved ones and relatives; decrease in the financial level of security; uncertainty in future; loss of life and value landmarks, etc. However, our biggest concern is that these disorders affect not only adults but also those who are the least protected — the children who are compelled to be in a negative emotionogenic environment.

On a global scale the problem of children's protection was and is relevant, which in its turn led to the need for the normative consolidation of their rights and freedoms in international decisions and declarations. Thus, the first such document was the Declaration of the Rights of the Child [4] adopted by the General Assembly of the United Nations, which states that humanity is obliged to give the child all the best — to provide his happy childhood, that he needs to be loved and understood for harmonious development. In connection with the worldwide increase in the number of child victims in armed conflicts, the Declaration on the Protection of Women and Children in Emergency and Armed Conflict [5] was adopted, which stated that these categories of people are often victims of inhuman acts, and the state and the community must make every effort to protect children and women from the devastating consequences of the war. The next step in solving this issue was the emergence of the UN Convention on the Rights of the Child [15], in which countries-participants undertake to provide the protection and care that are necessary for the well-being and healthy development of a child and take all necessary measures to ensure his protection from all forms of discrimination or punishment. Ukraine supported them and joined the list of countries-participants in 1991, ratifying the Convention by the relevant resolution of the Verkhovna Rada.

Today, the Ministry of Education and Science of Ukraine has developed "Methodological recommendations on the peculiarities of teaching in preschool and comprehensive educational institutions for refugee children and children recognized as humans in need of additional protection, particularly those ones who are separated from the family" [16]. The document tells about the vulnerability of this category of people experiencing change, "stress associated with deprivation of home, the lack of familiar things, the loss of friends, relatives, sometimes parents, deprivation of their care and love", preschoolers overcome numerous shocks that injure children's psyche, the "morally psychological state of the child" dramatically changes and "often has a devastating impact on children's psychological world", which leads to "the feeling of discomfort, a decrease in activity and self-esteem; an increase in anxiety and aggression is often observed, which causes changes in value orientations of a child, the emerge of negative attitude towards other people" [16, p. 10]. Therefore, the tasks of a preschool educational establishment are: creating conditions for the general emotional comfort of the child; rehabilitation, preservation and strengthening of children's psychological health; positive perception of the child by the employees of the preschool educational institution and children's group [16, p. 11]. And we fully support the idea that one of the ways to ensure the emotional comfort of a preschool child is to integrate pedagogical efforts concerning formation of a sense of security based on the principles of a personally oriented

approach that involves the continuity of the work of educator, social teacher and psychologist and their cooperation [16, p. 11].

The importance of the chosen theme is supported by the research carried out by the Ukrainian Institute of Research of Extremism [7], which indicates that the society and the state must worry about security, education, the opportunity of full access to children affected by military actions, to rights and freedoms. The publication focuses on the fact that the hidden problem of the war is that during it a new generation is forming, the generation brought up on the values that are relevant for wartime — popularized aggression, violent methods of solving issues, the norms of morality of peaceful life, norms of law are discredited, and all these determine the norms of behavior of citizens of Ukraine, who grew up during the war period. And repeatedly the attention is paid to the need to involve professionals in the process of helping children: teachers, practical psychologists, social educators.

The influence of armed conflicts on the formation of the child's personality and his emotional development, in particular, is the subject of research by many scholars, namely:

1) the problem of emotional, behavioral and biological consequences of the impact of disasters, terrorist acts and armed conflicts on the development and upbringing of preschool children and identification of ways to mitigate this devastating impact (Hamiel, Wolmer, Pardo-Aviv & Laor [11]);
2) the complexity of the education and upbringing of refugee children related to the lack of educational institutions, the presence of behavioral problems or difficulties in social interaction, because resettlement creates additional stress factors (Graham, Minhas & Paxton [10]);
3) questions of early identification of symptoms of negative impact of traumatic events on the overall development of the child's personality and early interference to help the child (Gonzalez, Monzon, Solis, Jaycox & Langley [9]);
4) examined how attachment style predicts changes in mental health, and whether change in emotion regulation (ER) intensity mediates that association in the context of psychosocial intervention among war-affected children (Eloranta, Peltonen, Palosaari, Qouta & Punamäki [8]);
5) family's influence on the emotional regulation of preschool children (Di Maggio, Zappulla & Pace [6]), etc.

The area of our scientific interests is the training of educators to ensure emotional comfort and well-being of preschool children in collaboration with a psychologist; the emotional world of a child, his emotional education and the problem of creating an emotionally developing environment in a preschool educational institution.

The priority **aim** of the study is to justify the directions of interaction between educators and psychologists that will ensure the development of internal capabilities of the child's personality and the formation of the ability to establish harmonious relationships with other people, taking into account his needs, interests, emotions and feelings. In this regard, the issue of creating

an emotionally developing environment becomes of particular importance since a person who is in a state of emotional discomfort and is unable to manage his emotional states and reactions has significant difficulties in the process of self-development, self-realization and social adaptation. The solution of these tasks is possible providing the interaction of teachers and psychologists, which will allow a comprehensive approach to the problem.

Influence of the military conflict in the East of Ukraine on livelihoods and upbringing of the younger generation

Recently, the publications and studies covering various aspects of the problem of education of the younger generation in the conditions of war has begun to appear and they examine the consequences of its impact on the formation of the child's personality. Within the framework of the project "Improving Capacity of Service Providers in Psychosocial Adaptation of Internally Displaced Families with Children" implemented by the International Charitable Foundation "Ukrainian Foundation for Public Health" in cooperation with the International Charitable Organization "East Europe Foundation", with the financial support of ChildFund Deutschland, a manual for practitioners in social interaction "Psychosocial help for internally displaced children, their parents and families with children from the East of Ukraine" was created, which combines work experience of Ukraine, Georgia and Bosnia. The manual states that contemporary Ukrainian society is facing another crisis period associated with an armed conflict in the east of the country. It gives statistics on the number of people in need of help and describes psychoemotional manifestations in children as the result of the negative impact of events, namely: feeling of insecurity, fear of the future, anger, aggression, shame and guilt, alienation and isolation from the environment, sadness; problems with learning, attention, the ability to memorize information, psychosomatic disorders [21, p. 12].

Yahav in the article considers the impact of direct and indirect exposure to war and terrorism on children's mental health and emphasizes the importance of providing children with safety and security, as well as addressing basic needs and establishing trust with the child. The author notes that the intensity of the impact depends on certain factors — "including the child's developmental stage, gender, the intensity and duration of exposure, the extent of life disruption, the availability of parental support, and the surrounding culture" [22, p. 90]. The scientist used the following methods of working with children who suffered from military conflicts and terrorism including relaxation techniques, art therapy, cognitive-behavioral therapy, and supportive therapy.

Joshi & O'Donnell [14, p. 275] note that the acts of war and terrorism are increasingly prevalent in contemporary society, and the problem of children as victims of this violence is often ignored, namely, they need substantial psychological and pedagogical help. The authors point to significant changes in social-emotional and cognitive development under the influence of negative life events, including the loss of loved ones, resettlement to other territories, the lack of educational structure and sharp changes in values in society. Children are characterized by vague, somatic responses to traumatic events that appear in emotional reactions to injury in the form of sleep disorders, sucking fingers,

the desire to keep a toy along with them, the emergence of anxiety and worry, being afraid to remain alone in the room, the constant need for attention [14, p. 277].

Special attention deserves the author's empirical study conducted by Aleksandrov, Okhrimenko & Serbyn who studied the individual psychological factors of predisposition to post-stress psychotraumatic experiences of children whose parents were injured when participating in hostilities in the area of anti-terrorist operation in eastern Ukraine. In this category of children there are various manifestations of stress, decrease in attention, aggressiveness or excessive passivity, nerve disorders and "distrustful suspicion and caution in actions, resulting in a tendency to anxiety and depression, loss of self-confidence, diminishes emotional stability and exacerbates vulnerability to changing feelings. They also decrease their social courage and activity, that is why they are less prepared to interact with unfamiliar circumstances and people around them. Coldness in relation with others and difficulties in communicating with friends appear" [1, p. 23].

Particularly important is the problem of protecting children in the territory of settlements located in the close connection to hostilities, conditionally they may be divided into two subgroups — refugee children who were forced to move from occupied territory with their parents and local children, who constantly see soldiers, military machinery and hear explosions. An urgent problem for children living in the post-war environment is the overcoming of psychological stress from military operations, and, what is more, the highest level of stress has appeared in the youngest children [7, p. 20].

Our own observations and experience of communicating with children living near the zone of armed conflict have confirmed the above-mentioned views of scholars and have shown that a significant number of preschoolers find it difficult to understand the emotional states of others, do not relate the manifestation of their emotions with the consequences to which they can lead, indicating the insufficient level of formation of the ability to regulate emotional manifestations. They have an increased level of anxiety, aggressiveness, low levels of stress resistance and difficulty in social adaptation. This forced us to dwell upon the problem of emotional well-being and comfort of preschool children and to investigate the readiness of educators and psychologists to interact with children affected by armed conflict.

Professional interaction of educators and psychologists in preschool educational institution

Many scholars (Bitianova [2]; Il'in [13]; Ruda [18]) emphasize that psychological and pedagogical activity involves close contact, mutual understanding between psychologists and preschool teachers, the presence of their ability to speak the same language, the coherence of their actions in the approach to the child. Preschool teachers in their activities should rely not only on pedagogical but also on psychological knowledge [13], teaching and psychology must be consistent with each other. The task of the psychological service of the educational institution is to induce the preschool teacher to realize his or her own pedagogical experience, to understand the possible reasons why it is

impossible to establish contact with the child, to find solutions to overcome the poor performance of the child, to find ways to create comfortable conditions for the stay of preschoolers in an educational institution, to take into account the individuality of each child [13, p. 14].

In her work Bitianova [2, p. 4] emphasizes the unity of the purpose of professional activity of a teacher and a psychologist — this is the child and the conditions of his full-fledged education and development. And although the methods and techniques of the abovementioned specialists are different, they objectively need the informational and organizational cooperation with each other, because only in this case the technologies that they are using work on the initially set goal.

Actual to our research is the dissertation of Ruda, who sees the collaboration of the teacher and the psychologist in such a way as "the psychologist carries out the diagnosis, the teacher carries out a holistic analysis of the child's personality and manifestations of his psyche under the real conditions of educational process. The psychologist on the basis of diagnostics offers a strategy of influence, projects the social situation of development, specifies mental parameters. The teacher selects adequate for these purposes methods and techniques of educational work, specifying the proposals of the psychologist" [18, pp. 36–37]. Thus, the successful solving of difficult tasks of education and upbringing depends crucially on the activities of the entire pedagogical staff and the professional skills of the teacher. It is he who really organizes and carries out the process of education and upbringing, and the psychologist is an equal member of the pedagogical team, providing the branch of the pedagogical process, which, no-one except him can provide anyone. At the same time "interaction, complementarity, mutual awareness in the educational process contribute to the creation of optimal conditions for the effective use of the synthesis of psychological and pedagogical knowledge and experience" [18, p. 53].

The interaction between the preschool teacher and the psychologist is an integrative phenomenon characterized by the convergence of the activities of each of its subjects on a single structural basis; the convergence of values and value orientations related to the personality of the person; jointly produced on the basis of reflection a set of goals and means, mutually determined joint actions, organization and stimulation of the educational process as a process of free personal development of each child in accordance with his individual inborn abilities, interests and inclinations; the choice of means and methods of pedagogical actions aimed at the development of activity and independence of children, the ability to self-government and self-realization; discussion of the results of the mutual activity. Such interaction is aimed at the humanization of the pedagogical process, which involves the development of preschooler's personality, his emotional sphere in particular, and will allow to help children who have acquired negative psycho-emotional impact as a result of armed conflict in the east of Ukraine.

In the methodological recommendations of the Ministry of Education and Science of Ukraine [16, p. 13], it is stated the need for appropriate rehabilitation (psychological, pedagogical, socio-cultural) of the refugee children and children recognized as requiring additional protection having survived in stressful situations and may be in a depressed state. Indicators of the effectiveness of the

work of employees of preschool educational institutions as for creating conditions for the general emotional comfort of a refugee child are determined the formation of the sense of security, trust to children and adults and the feeling of maximum emotional comfort in a new natural and social environment.

In a manual for practitioners of the social sphere [21] it is also indicated that there is a crisis experienced by the professional environment of teachers, psychologists and social workers, which consists in the absence or imperfection of available methods of working with families and children who have been affected by the military conflict. It provides recommendations for facilitating the process of adaptation of internally displaced children to new preschool institutions and methods that can be applied to work with the children under stress. The requirements for professionals who can provide assistance are defined: "it is important to respect people you are trying to help regardless of your own values and beliefs; be aware of the difference between you and the person you are trying to help and respect these differences; you need to understand the limits of your authority and appreciate that you are not the judges of life, deeds and attitudes of another person; it is worth to consider yourself as a guest who was asked to provide help, but not to decide on the fate of other people and to make sentences" [21, p. 54].

In our opinion, the interaction in the dyad "a preschool teacher-a psychologist", aimed at creating of an emotionally developing environment, is most successfully implemented in joint planning and in psychological and pedagogical consilium, seminars, workshops, meetings; during the joint conducting of educational activities, in keeping common documentation, mutual attending of classes, their mutual analysis and mutual consultation. The indicated forms of interaction between teachers and psychologists allow to plan and coordinate joint actions, control their implementation and expand the area for self-improvement and self-development.

Creation of an emotionally developing environment in the preschool educational institution in the process of interaction between preschool teachers and psychologists

The environment is the source of personal development and a kind of catalyst for the process of self-realization, which can accelerate or slow down this process, and under the developing environment we understand the optimal conditions for the normal development of personality, ensuring the development of a complex of person's abilities, focusing on individual norms, taking into account individual and personality features. According to the context of the study, there is a need to substantiate the essence of the emotionally developing environment, which would contribute to the emotional comfort and well-being of preschool children. It will allow to enrich and substantially deepen the process of cognition of the surrounding reality and emotional sphere of a person, develop emotional personality qualities and skills, will promote the reception of experience of emotional attitude to the surrounding world by preschoolers, will develop their emotional activity and will reduce the influence of negative emotionogenic factors caused by armed conflict on the child.

We believe that an important part of the emotionally developing environment is *the emotionally positive atmosphere and emotionality of the educational process*. Famous teacher Suhomlinskij [19] attached great importance to the emotional atmosphere of the educational process and emphasized the organization of the spiritual activities of children. To do this, it is necessary to conduct the organization of educational activities in educational institutions on an optimistic basis, belief in the child's abilities; to raise empathy, respect for the feelings and emotions of another person; give opportunities for emotional detection to every preschooler, etc. Zins, Weissberg, Wang & Walberg [23, p. 264] confirm all these in their studies, considering that for the healthy development of the personality his/her emotionally-friendly environment in the educational establishment matters.

In our opinion this can be achieved by: creating favorable conditions for a child to stay at a preschool educational institution; increasing of positive emotionogenic objects in the surrounding and educational material; helping children who experience emotional discomfort and are in a state of increased anxiety and tension. It is advisable to focus children's attention on the emotional states of a person, to discuss with the preschooler his mood and causes of its occurance, to conduct a joint analysis of emotionogenic situations, to create situations that contribute to the emergence of interest in the emotional states of a person, to emphasise on the mood of literary heroes, their emotional behavior, etc.

The emotionally developing environment includes the *emotional relationship between children and their interaction with the educator*, which allows to meet the need for preschoolers in communication and contributes to increasing their emotional experience. The key to success is to recognize the decisive influence of the emotions of a preschool teacher and a psychologist on the process of communication with children, because the effectiveness of work depends on how they possess the technique of emotional stimulation and contact. Thus, Sutton & Wheatley [20, p. 327] believe that the emotional state of teachers affects the process of cognition of the surrounding world by the child, the attitude towards the events that occur around the child, his/her motivation and behavior.

Establishing contact between a teacher and children and a favorable climate in the team will promote: the formation of the interest of preschoolers and the desire to learn more about the ways of adequate emotional behavior; education of respectful attitude to the emotional state of a person; the expansion of knowledge of children about the emotional sphere of the person, expressive channels for the detection of emotions (mimic, motor, speech) and methods of adequate emotional behavior; the formation of emotional personal qualities and skills in them. For this it is worth using tasks for the identification and reproduction of human emotional states; establishing a connection between the identification of emotions and the reciprocal reaction; integrity and correspondence of verbal and non-verbal channels of manifestation of emotions; emotional interpretation of situations; establishing a connection between emotional behavior of a person and its consequences; forecasting the results of communication depending on the nature of emotions; the search of the most optimal ways of revealing emotions; analysis of the emotional state (own and other

person); self-control on the manifestation of emotions and their self-regulation; adjustment of emotional behavior and analysis of the adequacy of the use of expressive channels for the manifestation of emotions, etc.

The environment should stimulate the desire to communicate, creative activity, to encourage the emergence and development of emotions and feelings. *The activity of children* makes it possible to consolidate and introiorise the acquired experience of emotional behavior, namely, it helps to understand own feelings and emotional states, to fix in children the positive emotional "Self" image based on an adequate representation of own emotional behavior, the recognition by children their own individuality and uniqueness and the ability of creative and original approach to solving emotional problems associated with constantly changing emotiogenic conditions. Here important role is played by the organization of independent activities of children, during which they can work and consolidate the acquired knowledge and skills; therefore, it is reasonable to use the tasks aimed at promoting the free expression of emotions; associated with the use of expressive channels in order to obtain a reverse emotional-positive (negative) attitude to the manifestation of emotions and regulation of emotional behavior; oriented to create a new original emotional image; for emotional improvisation, etc.

Having revealed the essence of the emotionally developing environment, the following problem arises in determining the practical directions of its creation in preschool educational institutions. Concerning this idea, the study conducted by Holmes, Levy, Smith, Pinne & Neese [12] seems interesting. The authors point out that "all too common exposure of young children to traumatic situations and the life-long consequences that can result underscore the need for effective, developmentally appropriate interventions that address complex trauma" [12, p. 1650]. The authors presented the Head Start Trauma Smart (HSTS) program to "decrease the stress of chronic trauma, foster age-appropriate social and cognitive development, and create an integrated, trauma-informed culture for young children, parents, and staff. Using the above modalities, the HSTS program is comprised of four components described below: Training, Intensive Individual Trauma-Focused Intervention, Classroom Consultation, Peer-Based Mentoring" [12, pp. 1652–1653]. In addition, HSTS offers a promising developmentally appropriate solution that combines evidence-informed modalities to offer training, classroom counseling, intensive intervention, and peer mentoring for parents and teachers in an integrated model [12, c. 1658].

According to Minou, an effective method that will allow to reintegrate children who have been affected by armed conflict into society is the "creative therapies for the child victims of war and armed conflicts. For example, the cultural media such as arts of interpretation and arts visual as well as the accounts of the children themselves, the creative word can decrease the psychological problems of the child victims of war and facilitate their rehabilitation in the community" [17, p. 229].

In our research we base on the highlighted by the author directions of interaction between preschool teachers and psychologists in the process of emotional upbringing of preschoolers [3, p. 94], the content and forms of implementation of which are being supplemented and changed in accordance with the

goal — the creation of an emotionally developing environment that will allow a child who has suffered from armed conflict, to harmoniously build relationships with the surrounding world and contribute to his/her emotional comfort and well-being:

1) *emotionally developing.* Provides the organization of work by a teacher, the task of which is to familiarize children with a complex world of emotions, methods of socially approved adequate emotional behavior (the organization of work of a circle "World of emotions", according to a specially designed program, classes are conducted by a teacher);
2) *emotionally supporting.* It is impossible to order emotions and feelings and to wait for the child to experience something that he does not feel, or to experience and show only positively colored emotions. Therefore, the task of educators and psychologists is that they must be able to directly or indirectly guide the emotions of preschoolers by organizing their activities and setting up a favorable emotional atmosphere in the group (teachers and psychologists while having children in kindergarten should create situations of success, involving children in interaction with one another);
3) *emotionally adjusting.* The joint creation by preschool teachers and psychologists of emotionogenic visual-spatial environment that promotes the emergence of various emotions in children, reducing emotional stress and creates a sense of security and safety (equipping the group room with positively colored emotionogenic objects: increasing the number of flowers, creating a living corner and a selection of musical works, the creation of the "Self-expression wall", where children can show their own emotional states, conduct "The Diary of emotions" by them, etc.)
4) *emotionally activating.* The activation of emotional reactions takes place when a child faces something new and unusual, therefore, this direction means the creation of emotiogenic situations by preschool teachers and psychologists that contribute to a surge of adequate emotions in children (conducting by preschool teachers and psychologists role-playing, activating games that allow to reproduce ways of socially approved emotional behavior; educational measures: holidays, sports activities, that expand the range of emotional experiences of preschoolers);
5) *emotionally preventing.* During the implementation of this direction preschool teachers and psychologists are using measures aimed at prophylactics of the emergence of emotional stress in children during tense intellectual and psychoemotional stress (exercises for muscle relaxation, psycho-gymnastic exercises that reduce the level of excitation, respiratory gymnastics, which acts soothing on the nervous system; mimic gymnastics, aimed at removing the overall tension of facial muscles; pantomime sketches; individual consultations; the organization and realization of these forms of work is carried out by both teachers and psychologists);
6) *emotionally correcting.* Provides conducting by psychologists the measures aimed at correcting the emotional and personal sphere of children: anxiety, fears, aggressiveness (correctional developing and training sessions aimed at stabilizing the emotional states of preschoolers).

Conclusions

The article reveals the importance of the emotionally developing environment in the formation of the personality of children who suffered from a negative psycho-emotional impact as a result of the armed conflict that is presently taking place in the east of Ukraine. Basing on our own researches and the views of other scholars, we believe that the effective results in solving the given tasks can only be achieved on condition of cooperation between teachers of preschool educational institution and psychological service. Based on the previous work experience of the emotional upbringing of preschoolers, the directions of cooperation between preschool teachers and psychologists were formulated, which could reduce the influence of negative emotionogenic factors on children and promote their emotional comfort and well-being. Perspectives for further research we see in the developing a program of realization of directions of interaction between a preschool teacher and a psychologist in the process of creating the emotionally developing environment in preschool educational institutions.

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Interpretive subjectivity and gender relativism in the theories of postmodernism

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Abstract. Interpretation as a stream of our consciousness is determined by different contexts and various narratives which stimulate this process reacting to the changeability of the world and human beings in it. The postmodern theory while losing its topicality keeps the key principle of interpretation firm and stable. Interpretation is simultaneously open and fixed, though the process of constructing narratives is not. As interpretation provides vast space for gender, the feminist theory proceeds with the "new feminist reading", and the aim of the feminist criticism lies in revealing misogynism and masculine approaches to different discourses and narratives. Still in postmodernism feminist interpretation often rejects "comprehension" in its classical meaning denying analogy, symmetry and equivalence. The subjectivity of feminist interpretation is not a transparent line between the human being and the surrounding world: the "better" is interpretation, the more "objective" seem our narratives, the stronger appear constructs stipulated by culture, gender, ideology.

Keywords: narrative, changeability, feminism, concept, translation, construct

Introduction

Nowadays scientists do not argue the statement that one of the main principles of the postmodern theory is its relativism. Researchers begin their discussions with noting the institutional assumption about representation of both the specific vision of the social reality and its specific epistemology. [5] Of great significance is also the fact that literature, in a broad meaning, has lost its importance as a depository of spiritual values of the human culture. These days the significance and appeal of literature are determined by the acceptance of the fact that all human activity is penetrated by "acts of interpretation". [7] Interpretation is considered to be simultaneously determined and open because the control over the development of the situation demands full realization of the reasons which stipulate our preference of the possibility of interpretation. On the other hand, narratives are not open but strictly fixed in our subconscious "Self". Narratives indicate what we are and what we can be in the world which is perceived by us. This process of constructing narratives is always enriched by "natural" interpretation, the latter accounts for the fact that this theme is in the focus of the interdisciplinary theories. Because interpretation

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is "living our lives", we may paraphrase Descartes by saying: "We interpret therefore we live". [11] The latter is directly connected with the complications of the relativism, in general, and the concept of the narrative knowledge, in particular.

As one of the basic characteristics of postmodernism is the supposition that there is no "privileged knowledge", researchers proceed with the statement that there is no "true interpretation" which might deprive all the alternative versions of interpretation the right of being considered in the theory. It is interesting to mention how R. Rorty puts it: "Relativism is the view that every belief on a certain topic, or perhaps about any topic is as good as every other. [17] In postmodernity knowledge cannot be valued outside the context in its broad meaning, consequently there never exist universal out-of-context criteria of the truth and reliability.

In the outcome, postmodern critics consider relativism as the main threat to truth. [4]

Thus the main connection between postmodernism and relativism is reduced to the principle of truth as justified opinion. As a result, it is hermeneutics that has become the key to the postmodern transformations of such ultimate concepts as Truth, the Beauty, God. [4]

Those fundamental transformations, which are taking place in many axiological categories, turn the verge between the good and the evil, the virtue and the vice into some conventional notions (M. Foucault, J. Derrida, R.Rorty, S. Zizek,etc.). In today's pluralistic world there are no certainties; and without any fixed ideas can we still love the truth, — asks J. Caputo, who explores different notions of truth that we can interprete. Postmodernists are certain: relativism means that there is no "Truth", there are just a lot of "competing" truths depending on our language, culture, gender, religion, needs, tastes, etc. [4] In the criticism of postmodernism, the fear that relativism, skepticism, nihilism support anarchy is obvious, and many theorists admit that postmodern philosophers have done much to produce that impression. For example, R. Rorty once said that truth was merely a compliment we pay ourselves when things are going well with our beliefs. [17] "Are we just a collection of narratives?" — ask scientists, who examine the "man" in his/her relation to the rest of reality. Postmodern researchers explore how today's rapid "movements" affect our understanding of ourselves. Starting their analysis with Descartes' claim that we are non-physical beings (even if it seems otherwise), and Locke's view that a person is self-conscious matter (though not necessarily in a human form), scientists depict how today's technology reconfigures our minds. [20]

Recently the feminist theory has not only opened the "sluice of silence" but changed the methodology of knowledge. In the context of "producing meanings" and their interpretations feminist researchers have set a problem of different perception of life by men and women as readers. Starting with S. de Beauvoir's statement that the woman is the eternal "Other" in the world of masculine discourses feminist philosophers have developed the theory of "critical revolution" — gynocriticism which was elaborated along with the French criticism (J. Kristeva, H. Cixous, L. Irigaray, etc.) and androgene poetics (M. Wittig, T. J. Atkinson, etc.) Gynocriticism having put women writers as a key research object simultaneously rejected the conception of a unique female essence and style (E. Showalter, J. Mitchell, S. Gilbert, etc.). In this connection

scientists address R. Barthes who in his books makes an accent on the interrelations of writing and the individuals. [3] It is worth while mentioning that feminist critics as a rule extol S. Freud for his acute observations concerning the psychological characteristics of women, at the same time Mitchell writes that both in their praises and attacks gender researchers often miss the fact that Freud analysed female psychology in the conception frame of patriarchy and physic diseases. [14]

On the whole, scientist claim that the research of women's literature along with the "female texts" has been the priority task of the feminist theory. It is considered an axiom that the "new reading" (i. e. interpretation) of different texts allows to escape traditional philosophic and socio-political interpretations of history and culture. R. Hof stresses that of great importance is the demand to understand that the interpretive history of sexes and their differentiation is in itself the part of the "social construction of reality". [10]

As interpretations are not eternal and they are capable of change, explaining how such changes take place is one of the most important tasks of today's interpretation theory. The intention in this paper is to show that while basic human disposition makes interpretation appear to come naturally, the forms it takes — do not, and approaches to formulating forms of interpretation should be analysed and considered in their interconnection with objectivity and relativism.

Drift from the vagueness of interpretation to the subjectivity of hermeneutics

Nowadays the words "hermeneutics" and "interpretation" cover a wide variety of the theories of interpretation that should be focused on the analyses of the postmodern mutations of the basic philosophic concepts. As a rule interpretation seems to be a way of putting things under research in the definite focus in a certain framework. One of the main characteristic features of postmodernism is considered to be as follows: there are no "absolutes" without interpretation though interpretation does not create ultimate "Truth". Today it looks like interpretations are ever and everywhere in the "postmodern condition". The valid example can be provided with the notion of "Beauty". The beauty as an ultimate concept is recognized by "intuition", but between the physical beauty and the spiritual one the gap can be installed, and simultaneously the problem of the taste arises, — the taste as the power of the design over the consciousness, as the capability to follow the demands of the vogue. In the outcome, the whole XXthcentury is marked by breaking the superiority of the beautiful over the ugly; nowadays, as F. Girenock puts it, the "ugly" exists "by itself", the "beautiful" also exists "by itself", and they have become equal. [9]

It should be stressed that the problem of interpretation in hermeneutics was stipulated by R. Barthes' "The Death of the Author", by putting the text and its meanings precisely under the postmodern conditions in which interpretations are inevitable because writing tends to a "zero degree of meaning". Thus, texts that readers use are evershifting, unstable and open to questions. R. Barthes notes that the traditional critical approach rises the following pro-

blem: how can we detect precisely what the author's intention is? The author is merely a "scriptor" — the word, that Barthes uses to disrupt the traditional continuity between the terms "author" and "authority". The scriptor exists to produce but not to explain his/her work, — underlines R. Barthes, and "The Death of the Author" develops a reader's response critical theory, which encourages readers for interpreting any text. Postmodernists assume textuality to be a moveable "woven tapestry", and it is intertextuality that weaves tapestries of individual texts together. The text does not belong to anyone, the text is simply there, waiting for someone to make a meaning, — the idea that acknowledges the fluid function of textuality and the ever openness for interpretation.

In "Mythologies" R. Barthes claims that everything or anything in culture can be decoded, not just literature, but love, fashion, photography, etc. For Barthes, words and objects have in common the organized capacity to say something at the same time, since they are signs; words and objects have the ability to appear natural, as if what they say were eternal and true instead of arbitrary and opinionated. [1]

Here R. Barthes is of great importance because he is an exponent of the semiotic model of language, which U. Eco calls "the natural language". As U. Eco puts it, any natural language consists of the plane of expression (lexis, phonology and syntax), and the plane of meaning which represents the complex of the notions that can be expressed. Any language organizes "universum" that can be thought and told about in a definite form of the content. Thus, the natural language is defined by U. Eco as a holistic system; though it is structured in a definite way, and proposes a definite vision of the world. [7]

And here arises the problem of denotation and signification. In structuralism, meaning is the product of a system of representation which in itself is meaningless. The latter is inevitably connected with the problem of translation: U. Eco claims, that as a result of its lasting search the European culture has put itself confronted with the urgent necessity to find the "language-mediator" which could bind the "linguistic breakings". The fact that the problem of translation concerns a "perfect" language is known to be mentioned by W. Benjamin, who wrote that because it was impossible to reproduce precisely the meaning of the source text in the target language, it was necessary to rely on the feeling of coincidence among the languages. The theoretical complexity of the problem was touched upon by F. W. Humboldt, who claimed that if no word of another language had an equivalent, translation was impossible but for the case of understanding translation as an activity which did not yield to regulation and formalization. [7]

The significance of the interpreter is always great when we deal with translation: because there is no perfect equivalence between the units of the codes, we can speak only about the adequacy of the messages. A translator does not substitute code units but change messages, thus a translator acts as an interpreter — encoding and decoding messages received from a source text. U. Eco proposes to think not of "a third language parameter" in translation but of an instrument of comparison. Presumably, in this case we speak about a metalanguage as a technical language; e.g., structuralism, which was devised to describe the properties of an ordinary language. Structuralists (F. de Saussure, C. Levi-Strauss and others) promised "liberation from the enigma of

meaning", but in the outcome, they came back to the language. It is important that P. Ricoeur demonstrates a complicated attitude to structuralism: he does not recognize it as philosophic discipline; to him, structuralism is science while hermeneutics is a philosophic discipline. Hermeneutics, according to P. Ricoeur, means finding out the meaning hidden in a symbol, and in this very meaning hermeneutics is philosophy.

However, proceeds P. Ricoeur, in every hermeneutic discipline interpretation is at the core of the linguistic/ non- linguistic language and life experience. [16] Specific features of hermeneutics are represented in the fact that the impact of the language on the individual, and of the individual on the language is realized by different ways. Here of great significance is a moment that multiple "vaguenesses", which lead to the distortion of the communication product, inevitably occur. As for the cultural communication in the literary criticism the term "resistance of the literary work to reading" is supposed to denote peculiarities of the language functioning in fiction.

From narrative individuation to gender relativism

Analysing reading in the way of deconstruction J. Miller claims that "resistance of the literary work to reading" is a property of words of the literary work, a property of rhetoric, results of interaction, games of tropes, concepts, narratives. It is an impression that a work of art produces on readers by means of the sequence of words", — J. Miller asserts not without the influence of the phenomenological school, closely connected with hermeneutics. [15] The paradox is as follows: the text makes a reader believe that he/she can determine the meaning of the text and simultaneously makes it impossible, which should not be mixed with understanding multiple meanings as ambiguity. On the other hand, it differs from the approach according to which every reader adds his/her own meanings to the text, and that is why any text acquires different meanings for different readers. However, readers — and writers as well — often yield in their estimations to dwell on the one general meaning in their necessity to rely on the faith concerning a piece of art. To Miller, it resembles the property of Mobius strip that simultaneously possesses both the one and the two surfaces.

Here we should recollect that J. Derrida mobilizes the radical poststructuralist implications of the point that structures of meaning include any observers of them: to observe is to interact, claims J. Derrida. [6] It is necessary to mention that in every hermeneutic discipline interpretation is located at the junction of the linguistic and the non-linguistic, the language and the life experience. [16] The crucial point is "the frame" constructed by both; (i.e. "the context"). Nothing can be understood without a set of presuppositions within which things are properly or improperly framed. [16] Still subjectivity is a kind of borderline between an individual and the reality, everyone and all are socially and ideologically constructed.

The fact that literature happened to be in the centre of the second wave of feminism in the 60s of the last century was not by accident. The literary discourse was one of the few by means of which it was possible to reconstruct the socio-cultural reality of women. Exposing negative women's images in the novels of H. Miller, D.H. Lawrence, H. Mailer, L. Tolstoy and other writers,

K. Millett, A. Dworkin, A. Rich, T. Moi and other researchers proposed the problem of the connection of femininity and its representation in the "masculine literature" and focused on it in their analysis of the feminine aesthetics, poetics, gynocriticism. Acknowledging that women have been "captives" of the masculine texts for centuries, feminist critics propose strategies which can help to avoid the captivity of the masculine literature: for instance, it is a strategy of the "resisting reader" (J. Feterly) or "new ways of reading" which on purpose cross the line of the "generic text", because not to perform the extending reading means to be "inside" the canon. Thus "reading-interpretation" has become an issue of power, a "critical stake" in the development of the feminist "reader-centered" theory.

Feminist interpretation of texts has been aimed at revealing gender inequality, and the latter is vividly represented in J. Lorber's conception: she analyses thirteen evolutions of the theory of gender inequality structured around the author's paradigm "reforming — resistence — riot" in different combinations of the structure "text-reader". [13] On the other hand, A. Kolodny assumes that pluralism and feminism can sound antagonistic, because pluralism lies in what G. Spivak calls "ideology of free entreprenership in action"; though A. Kolodny offers to adopt a phrase "playful pluralism". [12] One of the main terms which is used by postmodernists is "life experience" and up to the 70s of the last century women's life experience had been considered physiological and secondary. Postmodernism in its deconstruction of the notion of "subject" destroys traditional dichotomies and consequently oppositional thinking on the whole. Still it is significant to stress: the issue of the validity of the women's experience has been very problematic in the postmodern anthropology. [19]

All mentioned above is reflected in the feminist interpretive reading of various texts. As for fiction, it seems D.H. Lawrence "suffered" most of all: only very apathetic feminists have not attacked his "Lady Chatterley's Lover", "Sons and Lovers", "The Rainbow" and other novels. The next layer of feminist interpretation is the "new reading" of S. Freud and other researchers of psychoanalysis. An interesting example is feminist interpretation of W. James' father-founder of the American psychology, his studies have been interpreted in the context of ethics and epistemology. [18] Concerning philosophical studies, it should be noted that all the periods of the Western philosophical thought have been analysed in the feminist interpretation (M. L. Shanley, C. Pateman, M. Batler, N. Frazer, E. Spelman, S. Okin, N. Chukhim, T. Vlasova, etc.)

Conclusions

In the postmodern theories there has established a tendency to interprete ultimate concepts as "symbols of change": the ambiguity of their meanings, the localized context, and the decentred life in the story-telling of narratives and histories.

In our postmodern movement away from the "Absolutes" we are approaching a "zero" point now. The problem also lies in the necessity to find the "language mediator" — not a "perfect language" (U. Eco) but a perfect work of an interpreter in the broad meaning of this word. The feminist interpretation of various texts during the last years provides a good testimony to this

supposition, at the same time it is important to stress that the work of an interpreter always means "crossing the line", — the line that is not transparent between the man and the reality of the world. However, the paradox lies in the fact that the "better" is interpretation, the more "objective" seem narratives, and the stronger become constructs stipulated by history, culture, gender, and ideology.

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Григорій Сковорода
(225 років зі дня смерті)

Grigory Skovoroda
(225 years from the date of death)

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Григорий Сковорода: Эстетика мысли и этика жизни

Наталия Кондратьева[1]

1. Великий Старец Григорий

«Гляньте, люди добри, старчик йде», — говорили в былые времена на Украине.

Старчиком далеко не всякого старика называют. В этом слове характеристика мощи ума, сердечного опыта. Старчик — мудрый странствующий человек, присутствие которого преображает всякий разговор, где бы не затеяли его люди, — в придорожной корчме, у степного костра на ночевье, в хате какой-нибудь... Своих старчиков узнавали в лицо и низко им кланялись как живому образу премудрости.

«Гляньте, та це ж старчик Григорий йде! ...»

Юрий Лощиц «Григорий Сковорода».

Последние 25 лет своей жизни Старец Григорий Сковорода ходил по селам Слобожанщины. Он исходил всю Харьковскую губернию, был в Белгороде, Воронеже, ходил по Слобожанщине и на север и на юг.

Григорий Сковорода учился в Киево-Могилянской Академии, пел в Санкт-Петербурге в Придворной капелле императрицы Елизаветы Петровны, был послан ее в Европу, где работал в библиотеках и слушал лекции в университетах Венгрии, Австрии и Германии, знал древнееврейский, латынь, греческий и немецкий языки. Изучал работы греческих, римских, итальянских, немецких и славянских философов.

После возвращения из заграницы преподавал в Харьковском коллегиуме. Стал писать свои философские сочинения, стихи, басни. Решил писать их на том языке, на которым говорили на Слобожанщине. Это был смешанный язык, ученые до сих пор спорят как определить его.

Изначально Слобожанщина, или как назвал эти земли опричник Ивана Грозного, немецкий рыцарь Генрих Штаден — Дикое поле, было прекрасным и опасным полем.

Опасное потому, что в нем можно было встретить разбойников, которые грабили редких заезжих, или повстречать татар, которые считали поле своей вотчиной. И прекрасное, так как поле было полно всякой живности и реки полны рыбы, и «ніколи плуг не проходив через незмірні хвилі

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диких рослин; тільки дикі коні, що ховались у них, як у лісі, витоптували їх. Нічого кращого не могло бути в природі: вся поверхня виглядала як зелено-золотий океан, скроплений мільйонами різних квіток. Крізь тонкі високі стебла трави проглядали блакітні, сині й фіолетові волошки; жовтий дрік вискакував угору своїм острокінчастим вершком; біла кашка крутими шапками виглядала на поверхні; занесений бозна-звідки колос пшениці достигав у гущі» [1].

К началу семнадцатого века Московия стала строить на Слобожанщине крепостные укрепления. Чуть позже началось заселение Дикого поля украинскими казаками, которые бежали от гнета польских панов и угрозы мусульманского плена, когда Османская империя захватила Каменец-Подольский и осадила Чигирин. Бежали в Дикое поле на вольницу и русские крестьяне. Так столкнулись в Диком поле три силы: русские гарнизоны и чиновники, украинские казаки и татары. Поначалу, казаки частенько объединялись с татарами против русских укреплений. Затем, казаки все чаще стали поступать на службу в русские гарнизоны для совместной защиты от татарских набегов и разбойников. Чиновники, выплачивая жалованье, стали вводить паспорта... Рождалась Слобожанщина со смешанным украинско-русско-татарско-латинским языком (часть украинцев, бежавших от поляков, вели богослужение на латинском языке). Великая степь как могучая океанская сила организовывала и умиротворяла своих детей. И к середине восемнадцатого века Слобожанщина была одним из самых спокойных и благополучных мест. Здесь были великолепные пасеки, зажиточные хозяйства и процветающие монастыри. Что еще ждала эта земля? — Она ждала Просвещения.

Три столицы: Санкт-Петербург, Москва и Киев — предлагали Сковороде престижные должности, но Слобожанщина звала своего просветителя и душа философа откликалась на этот зов.

Сковорода проповедывал культ мысли, говорил, что, если мыслит человек, что духовные ценности выше материальных, то и жизнью своей должен это доказывать. Поэтому, отказавшись от благополучной столичной жизни, с котомкой за плечами, флейтой и посохом ходил он по селам Слобожанщины и советовал людям грамоте учиться, в мире с соседями жить, что лучше в пищу употреблять, рассказывал как какие болезни лечить... Советовал чаще на небо смотреть, где живут счастливые звездные боги, презревшие плотские страсти, войны и безмерные богатства...

Щасливы, кои тщились еще в век старинній
Взвесть ум виспр і примечать звездних богов чины.
Можно верить, что оны, всы земніи здоры
Оставя, взойшли сердцем в небесніи горы.

Не отвлекло сердец их угодіе плоты,
Ни воинскіи труда, ни штатскы заботы,
Ни ветренная слава, ни праздніи честы,
Ниже безмерних богатств приманчивы лесты...

Григорий Сковорода «Похвала астрономии»
(EX OVIDIO FASTI)

Был Сковорода как сеятель, словно разбрасывал по всей земле где проходил зернышки просвещения. И после его ухода, открылся в Харькове университет,— первый на территории современной Украины, и стали по городам Слобожанщины открываться гимназии и издаваться книги. А философские труды Сковороды стали тем камнем или основой на которой выросли философские школы и мыслители следующих времен.

2. Скала

«Бог для меня это — разум, скала»
Григорий Сковорода

Скала или Камень — петра (от лат. pietra) понимались Григорием Сковородой как духовное средоточие, опора всей духовной жизни.

Все минає, але не бог і не любов.
Все є вода — навіщо на води надіятись, друзі?
Все є вода, але буде дружня пристань.
На цьому камені заснована вся церква Христова.
Це нам і кефа, петра і скеля.

Григорий Сковорода владея, греческим, немецким и древнееврейским, изучал античную философию, — Сократа, Пифагора, Платона, Плутарха... Своими учителями он считал столпов великой александрийской школы — Климента Александрийского и Оригена, которые выступали за то, чтобы христианское учение включало в себя интеллектуальную часть античной культуры. Сковорода любил сочинения Цицерона и Горация, Максима Исповедника и Филона Иудейского. В понимании человеческой природы был близок немецким философам, таким как Майстер Экхарт и Якоб Бёме, учение которых проникло в Московское царство через Немецкую слободу в XVII веке. В Троице-Сергиевой Лавре изучал жития христианских святых... Синтезируя философские учения разных времен и народов, Сковорода создал свое собственное философское учение, которое он раскрыл в философских баснях, притчах, стихах, письмах. В центре философского мировоззрения Сковороды — учение о трех мирах.

Сковорода учил, что существует три мира: Вселенная (макромир), человек (микромир) и мир символов, который связывает первые два (для философа мир символов это в первую очередь Библия). Каждый из этих трех миров имеет свою проявленную, видимую и невидимую части [2]. Задача человека познать свою невидимую часть, что даст ему счастье найти гармонию с невидимой частью Вселенной, суть которой есть мир Идей.

Через Оригена Сковорода воспринял представление о безначальности и бесконечности мира. Наряду с Вольтером, Дидро, Руссо воспевал культ мысли:

«Что есть душа, если не бездонная мыслей бездна?».
«Пружиной всей нашей телесной машины есть мысль».

Взывал Сковорода и о человеческом сердце, говорил, что оно есть главное око, главная точка человека, вместилище Бога в нем.

В самых разных формах Сковорода утверждал первенство духа над телом и проповедывал путь в невидимый духовный мир:

Трудно покорити гнев и прочіи страсты,
Трудно не отдать себе в плотяніи сласты,
Трудно от всех и туне снести укоризну,
Трудно оставить свою за Христа отчизну,
Трудно взять от земли ум на горы небесны,
Трудно не потопитися в міра сего бездне.
Кто может победить всю сію злобу древну,
Се цар — властитель крепок чрез силу душевну.

Эти заветы Сковорода утверждал своей жизнью. Место и время было удачным, — Слобожанщина XVIII века, как уже говорилось, было спокойным, зажиточным местом с прекрасной природой, здесь привольно чувствовало себя купечество, здесь стремились обзавестись усадьбами многие титулованные и богатые люди. В достаточно спокойные и благополучные времена людям легче поверить в приход Царства Божия и победу над змием. Во времена же политических и военных потрясений, революций, трудно бывает устоять в этой вере и исход часто решается числом устоявших ибо «не в силе Бог, а в правде», истине, духе.

Григорий Сковорода родился 3 декабря 1722 года недалеко от Полтавы в селе Чернуха Лубенского полка, входившего в черту Киевской губернии в простой семье мещанского достатка. По отцовской линии происходил из мелкоземельных казаков. Отец Григория Сковороды, — Савва Сковорода был связан с казацким духовенством и служил священником в селе Чернуха. По материнской линии Григорий Сковорода восходил к роду крымско-татарских ханов. Его мать, Пелагея Шангиреева, была дочерью Степана Шан — Гирея из рода ранее крещенного татарина Шан Шан-Гирея, предположительно младшего брата хана Мухаммеда Гирея III. Родственники по линии матери, получившие дворянство и фамилию Полтавцевых, проживали в Санкт-Петербурге и занимали там высокое положение. По одной из версий, именно Игнатий Кириллович Полтавцев помог своему кузену Григорию Сковороде поступить певчим в Придворную капеллу в Сантк-Петербурге, где будущий философ научился игре на скрипке, бандуре, гуслях и флейте. Там же Сковорода завел дружбу с Алексеем Разумовским, который был родом из днепровских казаков, и который со временем был возведен в графское достоинство и стал фаворитом императрицы Елизаветы Петровны.

Григорий Сковорода имел много знакомств в высших кругах духовенства как в Киеве, так и в Санкт-Петербурге и в Москве, т. к. в середине XVIII века все высшее духовенство Российской Империи составляли украинцы, в основном выпускники Киево-Могилянской академии, где учился и сам Сковорода [3]. Еще с конца XVI и весь XVII век грамотные украинцы приглашались в Московию, а потом в Российскую империю в качестве духовенства, учителей, служащих дипломатических ведомств. Русские монархи поддерживали политику приглашения просвещенных украинцев и платили им высокие зарплаты, ибо велика была потребность в образованных, знающих иностранные языки и активных в общественных делах

людях. Однако, когда дело касалось автономии или независимости украинцев, — здесь российская власть была беспощадной.

Григорий Сковорода, как философ, в своем творчестве стоял над временем и пространством, как человек любил свободу высказывать свои мысли, ему мила была среда казацкого духовенства, любил посещать монастыри и был привязан к своему слобожанскому краю, его природе.

В 1754 году Григорий Сковорода, имея рекомендательное письмо, вместе с проповедником Владимиром Калиграфом, который вез с собой труды Эразма Роттердамского и Лейбница (с которыми Сковорода по дороге мог ознакомиться), отправился в Москву и нашел приют в Троице-Сергиевой Лавре. Настоятель лавры Кирилл Лящевский происходил из казаков и в молодости обучался в Киевской духовной академии, а казначеем в это время в Троицко-Сергиевой лавре был епископ Нижегородский и Алатырский Феофан Чарнуцкий, происходивший, как и Сковорода из села Чернухи. В результате Григорию Сковороде было позволено пользоваться уникальной лаврской библиотекой. Здесь родился его стихотворный цикл «Сад божественных песней».

В начале 1760-тых годов Григорий Сковорода преподает в Харьковском коллегиуме, где он читает курс греческого языка. В это время завязывается его дружба со студентом-богословом Михаилом Ивановичем Ковалинским (Коваленским), который с этих пор становится его ближайшим учеником и другом на всю жизнь.

3. Учитель и ученик

Люди, которые приходят в этот мир для просвещения, подвижники, те, кто несет людям новые знания, законы жизненной этики, — ученые, художники, музыканты, поэты, философы, — как правило обречены на духовное одиночество, — окружающие не понимают их. И чем выше план идей, с которыми идет в мир подвижник, тем большее непонимание, а следовательно и раздражение и вражду он испытывает по отношению к себе. Григорий Сковорода не был счастливым исключением. И хотя императорский двор покровительствовал Сковороде, — ведь философ своими произведениями способствовал имиджу империи как монархии просвещенной, в своем окружении философ родственных душ не находил. И какова была его радость, когда судьба свела его с Михаилом Ковалинским, человеком блестящего ума, тонко чувствующим и способным в изучении языков. Сковорода стал его учителем не только в греческом языке, но и в своей философии.

Ему он искренне писал о своих размышлениях и переживаниях. Всего известно о 80 письмах Григория Сковороды к Михаилу Ковалинскому. В этих письмах Сковорода, например, пишет: «Я знаю, така вже моя натура, що, будучи в стані великого гніву, я відразу стаю лагіднішим навіть по відношенню до найлютіших ворогів своїх, як тільки помічаю хоча б незначний вияв прихильності до мене. Як тільки ж помічаю, що хтось мене любить, я готовий віддати йому половіну днів життя мого, якщо б це було можливим і дозволеним, зрештою, хто добровільно заради друга наражається на небезпеку, той певним чіном ніби витрачає своє життя

для нього. Іноді могло здатися, що я гнівався на найдорожчих мені людей; ах, це не гнів, а надмірна моя горячковість, викликана любов'ю, і прозорливість, тому що я краще від вас бачу, чого треба уникати і до чого прагнути.

Отже, поки я усвідомлюю самого себе, поки душа керує тілом, я буду дбати лише про те, щоб всіма засобами здобути любов благородних душ. Це мій скарб, і радість, і життя, і слава». (Лист липень-серпень 1765 р.)

Письма 1760-тых годов к Ковалинскому — это разбор литературных произведений, прежде всего древнегреческих и латинских, сочинительство, разговоры о философии и мудрые жизненные наставления. В последних письмах к своему другу и ученику Сковорода раскрывает смысл своих последних философских произведений, дает оценку своим литературным трудам, как бы напутствует как к ним относиться.

Кем же был Михаил Иванович Ковалинский?

Ковалинский (Коваленский) Михаил Иванович родился в 1745 году в крепости Алексеевская на территории Харьковского слободского казачьего полка, в семье протоирея Ивана Ковалинского.

В 1762–1769 гг. учился в Харьковском коллегиуме, затем преподавал в нем.

1770–1775 воспитатель детей гетьмана Войска Запорожского графа Кирилла Розумовского.

Закончил Страсбургский университет.

В середине 1780-тых правитель канцелярии графа Г.А.Потемкина.

1793 — генерал-майор.

1797 — губернатор Рязанской губернии

1801 — назначен куратором Московского университета.

Блестящая светская карьера ученика и бездомный, одинокий, странствующий путь учителя, в конце которого он передал все свои сочинения Михаилу Ковалинскому, вызывает ряд вопросов, на которые отвечает сам Ковалинский:

«Свет облагоприятствовал его (Ковалинский пишет о себе в третьем лице) своими дарами, наложил на него усыпление, дал ему жену, друзей, приятелей, благодетелей... Но дары сии напоены были соком корня их и свойствами начала их. Он увидел в счастии превращения, в друзьях измену, в надеждах обман, в утехах — пустоту...

Удручен, изможден, истощен волнениями света, обратился он в себя самого... прибыл из столицы в деревню. В глубоком уединении остался он один, без семейства, без друзей, в болезни, в печалях, в беспокойствах, без всякого участия, совета, помощи... Промысел божий воззрел на него в развалинах бытия его, воздвигнул дух мудрого, сердце друга, и Сковорода семидесятитрехлетний, по девятнадцатилетнем невидении, одержим болезнями старости, несмотря на дальность пути, на чрезвычайную ненастную погоду и на всегдашнее отвращение к краю сему, приехал в деревню к другу своему, село Хотетово, в двадцати пяти верстах от Орла» [4]. Здесь учитель и ученик о многом беседовали. Ковалинскому нужно было пройти испытание светской жизнью, чтобы понять то, что с самого начала понимал его учитель. Бодрый дух Сковороды поднял настроение ученика, а главное Ковалинский понял слова учителя: «Счастье человека состоит в том, чтоб,

узнав собственную в себе способность, по оной употребить себя в жизни». Этой способностью для Ковалинского было запечатлеть жизненный путь своего учителя и нести его учение дальше. Теперь Ковалинский знал, как употребить свою способность. Григорий Сковорода вскоре покинул земной план, а Ковалинский вернулся в свет, был назначен губернатором вновь созданной Рязанской губернии. Он описал жизненный путь своего учителя и его философию, его встречи с разными людьми, его горести и радости в биографической повести «Жизнь Григория Сковороды, написанная 1794 года в древнем вкусе». Это написанная любящим сердцем,

проникновенная повесть о великом мудреце. Ковалинский переписывал эту повесть и произведения самого Сковороды и списки расходились среди знакомых, те в свою очередь переписывали и раздавали их дальше, так учение Григория Сковороды входило в умы и сердца людей.

4. Non omnis moriar (Horatius)

«Весь я не умру»
Гораций — эпиграф к «Жизни Григория Сковороды» Михаила Ковалинского

Всякому городу нрав и права;
Всяка имеет свой ум голова;
Всякому сердцу своя есть любовь,
Всякому горлу свой есть вкус каков,
А мне одна только в свете дума,

.....

Как бы умерти мне не без ума.
Из сего зерна: Блажен муж, иже в премудрости умрет.

Григорий Сковорода. «Сад божественных песней»

Григорий Сковорода умер 29 октября (9 ноября) 1794 года в ясном понимании своей кончины, без всякого страха, в выбранном и любимым им крае, в селе Ивановка (сейчас Сковородиновка) в пятидесяти километрах от Харькова, в дворянской усадьбе Кирилла Кармазина. По преданию Григорий Сковорода сам выкопал себе могилу, одел чистую одежду, лег на кровать и умер. Усадьба в Сковородиновке уцелела, сейчас в ней находится Музей Григория Сковороды. В музее можно увидеть маленькую комнатку, где закончился земной путь философа, его личные вещи, его скрипку.

В своей повести о Григорие Сковороде Михаил Ковалинский рассказывает о том, что иногда его разговор с учителем касался вопроса смерти и Сковорода говорил,что сильнее страх смерти нападает на человека с возрастом, этот страх есть враг человека и надо заранее заготовить оружие против этого врага. Этим оружием Сковорода считал чувство сделанных за жизнь добрых дел, реализацию своих способностей и подчинение воли своей воле творца.

Придет час,— учил Сковорода,— сон земной жизни кончится, мыслящая сила пробудится и в иной круг бытия вступит дух.

Трудно до конца понять и оценить интеллектуальный и духовный вклад Григория Сковороды в развитие философской мысли в восточнославянских землях, которые до той поры философскими трудами не славились. Славились своими духовными учителями,— Антонием Киевопечерским и Сергием Радонежским,— которые дали устав общинной жизни; славились своими подвижниками и духовными героями, отдававшими свои жизни за веру, проводившими свое время в молитвах за человечество, но не было до Сковороды на этих землях философа, кто бы осмыслил философию в историческом аспекте, дал синтез идей античных мыслителей, христианских философов и христианских подвижников как учение о человеческой природе, значении мысли и просвещения для развития духа, о Библии, как книге о человеческом сердце...

Зерна мыслей, посеянные Сковородой, расходились списками и прорастали в произведениях литераторов и религиозных философов. Один из самых известных философов «серебряного века» Владимир Соловьев, следуя Сковороде, искал универсальный синтез науки, философии и религии, развивал учение о Софии-мудрости, имел сходное представление о природе человека как о микромире. Сковорода был двоюродным прадедом

Владимира Соловьева, их объединяло не только чувство вселенскости и универсализма, но и их жизненные пути,— Владимир Соловьев так же прожил жизнь одинокого бездомного странника. В свою очередь философские работы Владимира Соловьева оказали большое влияние на целую плеяду последующих философов,— Н Бердяева, С. Франка, князя С. Трубецкого, Н. Лосского, С. Булгакова... в той или иной мере все развивали христианскую философию, основанную Григорием Сковородой. Ренессанс Серебряного века закончился с приходом к власти большевиков. Один из первых декретов советская власть отменил преподавание греческого языка и латыни. Затем началось изгнание из страны интеллектуальной элиты. На пароходах и поездах высылались известные ученые, профессора, писатели, художники. В историю вошел так называемый «Философский пароход» на котором в 1922 году было выслано более 30 известных философов, среди которых были Н. Бердяев, С. Франк, С. Трубецкой, Н. Лосский, С. Булгаков, И. Ильин, Б. Вышеславцев... [5].

Может быть если бы эти сотни талантливых и мудрых людей не были бы высланы заграницу,— история страны была бы другой? Ведь судьба народа зависит от его духовной силы, наличия достаточного количества людей глубоко мыслящих, ставящих интересы общества выше своих личных интересов, вопросы духа выше проблем тела, у кого есть «и кефа, и петра, и скеля» как писал Сковорода.

Сковорода относится к людям, которых называют титанами, людям, которые руководствуются критериями вечного, идеями, о которых еще говорил Платон. Платон говорил, что независимо от преходящих канонов красоты, существует идея, принцип Красоты, который неизменен. Как неизменен от пристрастий времени принцип Любви, принцип высшей Справедливости, принцип Братства... Мы же смотрим на все с позиции нашего времени, общественного мнения, нашего удобства, покупаемся на простые, легкие и быстрые рецепты получения денег и славы. Это делает нас сле-

пыми, неспособными отличить истинное от ложного, наивными и доверчивыми к тем, кто умеет лучше себя преподать и больше обещает, без малейшего понимания того, что подобный человек может оказаться обманщиком и подлецом.

Вечные идеи и идеалы изменяя свои временные проявленные формы никогда не умирают и волнуют души, способные их воспринимать.

По подсчетам одного из исследователей творчества Григория Сковороды, Леонида Ушкалова, о Сковороде уже написано более пяти тысяч (!) научных и научно-популярных работ [6]. Много работ посвящено сопоставлению учения Сковороды учениям других философов, разным точкам зрения на творчество Сковороды, его отношениям с современниками... Но есть одна интересная тема,— тайна магнита, притяжения к творчеству Сковороды, желание сопоставить свое время с его творчеством.

В своей книге «Ловитва невловного птаха: життя Григорія Сковороди» Леонид Ушкалов пишет: «Аж ось і наше сьогодення. Кінець червня 2001 року. Золотоверхий Київ, що його так любив Сковорода. Папа Рімський Іван Павло II виступає в Маріїнському палаці...

Папа цитує всього лиш два рядки поезії Сковороди. Але що то за рядки! На хвилях їхнього ритму — і щемке відчуття зникомості всього земного, і чисті, мов роса, віра та надія, і любов як Божа присутність у світі:

> Omnia praetereunt, sed amor post omnia durat.
> Omnia praetereunt, haud Deus, haud et amor.

По-нашому я б переклав їх так:

> Все мина, лиш любов зостається по всьому.
> Все мина, та не Бог, не любов». [7]

Кажется, что так давно это было, как в другой жизни. А сегодня в творчестве Сковороды нас в первую очередь притягивает не красота его поэзий, а понимание им значения мысли в союзе с сердцем и этика его жизни, ее чистота, простота и красота. В свое время Сковорода не только философией, но и всей своей земной жизнью внес неоценимый вклад в просвещение славянских земель. Михаил Грушевский в своей книге «З історії релігійної думки на Україні» цитирует полтавского мемуариста Лубяновского: «Люде, особливо з тих слобід і хутарів, де він (Сковорода) частійше бував і довго зіставався, любили його мов свого рідного. Він давав усе, що мав: добрі поради, остороги, учення, приятельскі докори...». Ссылается Грушевский и на известного писателя Данилевского, который принадлежал к знатному роду Слобожанщины и хорошо знал среду общения Сковороды: «За нестачею науки і літератури в столиці слобідського намісництва, до Сковороди тягли всі тодішні живі уми і серця. Про нього писали листуючись, обясняли, спорились, розбирали, хвалили і лаяли. З огляду на поважаннє, яким він користувався, його можна було назвати мандрівним університетом і академією українських (себто слобідських) поміщиків,— поки в десять літ після його смерти безсмертний подвіг В.Н. Каразіна не привів до відкриття в Харкові університету. Се діло так легко й скінчилось, що ті поміщики, які в 1803 р. підписались на нечувану суму (на заложеннє університету), здебільшого були непомітно для того приготовані: все се були або ученики, або близькі знайомі й друзі Сковороди». [8]

В своем учебнике по этике для харьковских школ Сковорода писал: «Як хочеш бути щасливим, не шукай свого щастя за морями, не волочись по палацах... Щастя в серці, серце в любові, любов у законі Вічного. Дяка блаженному Богови, що потрібне зробив не тяжким, а тяжке непотрібним». И дальше Сковорода поясняет свою мысль,— если бы счастье зависело только от денег, то не все могли бы иметь много денег, если бы счастье зависело от места рождения, не все могли бы родиться в одном месте..., но есть нечто, что доступно всем.

Всем доступно счастье как особая радость,— все могут радоваться первому снегу и цветам, всей красоте природы, все могут радоваться своему умению помочь другим, быть кому-то нужным, сделать что-то доброе во славу божию... Надо только чтобы сердце могло чувствовать и сопереживать, чтобы делая дурное другим сердце сжималось от боли, делая доброе сердце радовалось, т.е. чтобы в сердце была любовь. Почему же какое необходимое (простое) и всем доступное стало сегодня таким трудным?

Сегодня в Украине много ВУЗов (652 по статистике 2018 г.), есть интернет со всеми книгами, лекциями и научными статьями, каждому доступны труды Сковороды, а молодежь уезжает учиться заграницу. Власть, деньги, слава обольщают людей,— много несчастливых вокруг...

5. «У греков звалась я Софіа в древной век // А мудростю зовет всяк руской человек...»

Г. Сковорода «Разговор о Премудрости»

Сто лет назад, в 1919 г., работая в Троице-Сергиевой лавре в Комиссии по охране памятников искусства и старины, изучая, как когда-то Сковорода, библиотеку лавры, Павел Флоренский написал работу о Троице-Сергиевой лавре [9], которая сегодня может иметь особый интерес, может прояснить некоторые грани происходящего и дать смысл и надежду на будущее, а так же глубже раскрыть творчество Григория Сковороды.

Историческая справка:

1) Святой равноапостольный Кирилл (Философ),— умер 1150 лет назад и похоронен в Риме. В 860–862 гг. вместе с братом Мефодием посещал киеворуские земли. Славянский просветитель, создатель старославянской письменности.
2) Преподобный Сергий Радонежский,— родился 700 лет назад. Иеромонах Русской церкви, основатель Свято-Троицкого монастыря (Троице-Сергиевой лавры).
3) Павел Флоренский,— священник, философ, ученый. Отказался выехать из России. Сослан на Соловки и расстрелян в 1937 году.

В своей работе о Троице-Сергиевой лавре Павел Флоренский рассматривает Киевскую Русь как период первообразования народа, народостановления. Этот процесс происходил под знаком идеи, выразившейся в символе Софии-Мудрости, впитавшей в себя отголоски древней Греции. Киевская Русь стала по мнению Флоренского провозглашением рождения новой Эллады. Он указывает, что сам язык древнеславянской письменности был выкован Кириллом и формально и содержательно из языка благороднейй-

шего — эллинского. Образ Софии, рожденный в Киевской Руси это образ Премудрости, Царицы Небесной.

Григорий Сковорода не только раскрывал благородство древнегреческого языка, более важно, что он включал в христианскую религиозную философию мудрость древнегреческой мысли, являлся рыцарем софийности.

Что касается Московии, то время ее рождения совпало исторически с упадком Византии.

По утверждению Павла Флоренского, Московия стала преемницей Византии, выполнившей свою роль и павшей под натиском Османской империи. Начало Московии определяется Флоренским как период государствостановления. Сергий Радонежский, как основоположник Москвы-России, заложил закон общежития как единения равных и провозгласил Троицу законом существования.

Киев раскрывал суть софийности через мудрых правителей, как Ярослав Мудрый, через богословов и философов, через великих женщин от княгини Ольги до многих святых и подвижниц и многих-многих мастериц, — певуний, вышивальщиц, художниц. Раскрывалась софийность и через молитвенность, терпение и милосердие. Все пути вели в святой Киев на молитву и покаяние («Язык до Киева доведет»). Киево-Могилянская академия заложила основу философского просвещения всей Российской империи.

В свою очередь Московия, а затем и Российская империя раскрывали суть Троицы через развитие государственности: Православия—Самодержавия—Народности; трех столиц, — Москвы—Санкт-Петербурга—Киева; союза рабочих, крестьян и советской интеллигенции в СССР; идеей тройственного союза славянских народов России—Украины—Белоруссии...

Павел Флоренский рассматривал Киев и Москву как потенциальную гармонию женского и мужского начал в их духовном выражении, он писал: «Женственная Восприимчивость жизни в Киевской Руси находит себе догматический и художественный символ Софии—Премудрости, Девы царственной, Художницы Небесной. Мужественное оформление жизни в Руси Московско-Петербургской выкристаллизовывается в догматический и художественный символ Пресвятой Троицы».

Григорию Сковороде было присуще не только проникновение в суть символа Софии-Премудрости, но и проникновение в суть Пресвятой Троицы, прозревая намного вперед, он заложил в основу своего философского учения троичность мира, где каждый из трех миров имеет свою троичную структуру, — непроявленную, полупроявленную и проявленную. В XX веке наука подошла уже к конкретному осмыслению этой троичности как жизни-сознания-мысли, материи-энергии-информации...

Гармония начал всегда держится на равноправии и своевременном развитии своих духовных потенциалов. Если же одно из начал начинает подавлять другое или происходит отставание в развитии, или вмешиваются внутренние или внешние деструктивные силы, то возникают взрывы-кризисы, военные конфликты, экономические проблемы, культурная деградация. Сегодня мы наблюдаем все перечисленные выше негативные аспекты.

Треугольник — первая геометрическая форма. Прямоугольный треугольник с двумя ортогональными сторонами с древних времен привлекал философов в качестве модели развития мира через разрешение противоположностей. Знаменитая теорема Пифагора в древней Греции рассматривалась как модель развития космоса: два ортогональных начала (два катета) создают по определенной формуле третью сторону треугольника (гипотенузу), вмещающую большее содержание, чем каждый из двух первоначальных. В сотворчестве противоположных начал рождается новое. Электрон и позитрон рождают фотоны (свет), кислород и водород рождают воду. Флоренский считал, что когда Киев и Москва будут иметь равноправные отношения, взаимоуважение, когда через науку и искусство раскроют суть «Софии» и «Троицы» на более высоком уровне, тогда родится новое человечество. Человечество нового нравственного закона, базирующегося на творческой кооперации; новых психоэнергетических возможностей, более высокого уровня сознания и понимания устройства мира, новой красоты через искусство. Сковорода, рассматривая суть софийности и троичности мира, видел результат их развития и сотворчества как синтез божественного закона и божественной любви.

Наверное сегодня говорить об особой красоте будущего трудно. Но когда апостол Андрей пришел на киевский холм, поставил на нем крест и прозрел «вечный Город», — никто этот город видеть не мог. А когда Кирилл пришел на киевские холмы во времена языческих племен, не знавших грамоты, разве кто-то понимал тогда какие великие книги будут написаны в Киеве...

Так и нам сегодня невозможно представить красоту человечества, которое мы уже сегодня творим. Творим, отстаивая и утверждая свою самостоятельность и равноправность, борясь против коррупции и невежества, мечтая о прекрасном будущем. И стоит на земле киевской, на месте города Ярослава Мудрого, уже более 1000 лет храм Софии-Мудрости и держит над нами свои руки Оранта, защищая нас и призывая «взять от земли ум на горы небесны, не потопитися в міра сего бездне».

24 марта 2019

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Natalia Kondratieva

Grigory Skovoroda: Estetics of thinkind and ethics of life
(225 years from the date of death)

Grigory Skovoroda (3.12.1722 — 9.11.1794, Russian Empire, present-day Ukraine) was philosopher, poet and composer. Skovoroda's work contributed to the cultural heritage of humanity. His way of life was universally regarded as Socratic and he was often called a «Socrates».

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Тематика та мета журналу

«Міждисципрлінарні дослідження складних систем» — це рецензований журнал із вільним доступом, що публікує дослідницькі статті, огляди, повідомлення, дискусійні листи, історичні та філософські студії в усіх областях теорії складних систем для впровадження взаємодії між науковцями з різних галузей математики, фізики, біології, хімії, інформатики, соціології, економіки та ін. Ми бажаємо запропонувати істотне джерело актуальної інформації про світ складних систем. Журнал має стати частиною наукового форуму, відкритого та цікавого як для експертів з різних областей, так і для широкої аудиторії читачів: від студентів до досвідчених дослідників. Журнал надає можливість для науковців з різних галузей презентувати нові ідеї, гіпотези, піонерські дослідження. Особливо запрошуються до публікації автори наукових статей та (але не тільки) наукових оглядів, проте статті з історії та філософії науки, інформації про наукові події, дискусійні повідомлення також вітаються.

Інформація для авторів

Журнал друкує оригінальні статті, огляди, повідомлення українською, російською, англійською та німецькою мовами. Статті українською та російською мовами мають містити переклад англійською назви статті, анотації та прізвищ авторів.

Статті приймаються виключно в електронному вигляді, файли мають бути підготовлені в LaTeX чи в текстовому процесорі (Microsoft Word, Open Office Writer і т. д.). Інші формати файлів мають бути попередньо узгоджені з редакцією. Ілюстрації мають бути високої якості, графіки та діаграми, що підготовлені в інших програмах, мають подаватися окремо, у вихідному форматі. Журнал друкується чорно-білим, проте у електронній версії матеріали будуть відображені у кольорі.

Статті, запитання, поради мають подаватитися до редакції через реєстрацію на сайті журналу **http://iscs-journal.npu.edu.ua**

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