МІЖДИСЦИПЛІНАРНІ ДОСЛІДЖЕННЯ СКЛАДНИХ СИСТЕМ

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Освіта в контексті духовної еволюції цивілізації

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Резюме. Аналізується місце і роль освіти в контексті еволюції таких форм духовно-практичного освоєння світу, як наука, культура, мистецтво, мораль, релігія тощо; автор стверджує, що освіта у всі часи й для всіх народів слугувала полем узагальнення матеріального і духовного досвіду, а відтак — полем навчання та виховання нових поколінь, загальним стрижнем, який визначає основний контент історії, слугує формуванню мислення (розуму), обрамленого духом гуманізму та людяності; в різні епохи взаємодія цих екзистенцій мали різний характер, однак, загальна тенденція — звернення до розуму як основного і вічного (помноженого на працю) джерела прогресу людської цивілізації й долучення до нього (освіта та виховання) підростаючих поколінь, залишається закономірністю, яка визначає людське обличчя цивілізації. Прагнення до єдності заради формування духовного єства (наукового, морального, художнього і т.п.) людини та виховання працьовитості розглядаються у якості головних домінант (парадигми) модернізації української освіти.

Ключові поняття: людина, освіта, культура, праця, цивілізація, виховання.

Розвиток освіти як основного інституту відтворення й употужнення людського капіталу є завданням цивілізаційного ваги та значення. Вкрай актуальним воно є й для України. В нинішніх умовах його основні питання концентруються навколо Концепції «Нова українська школа» та недавно прийнятого (2017 р.) закону України «Про освіту». Знання, компетенції, цінності розглядаються, при цьому, у якості своєрідних центрів біфуркації, з освоєнням яких ми зможемо відшукати той філософський камінь, який зрештою зробить народ освіченим, розумним і перспективним, поставить українську спільноту на рейки цивілізаційного поступу.

Важливим у цьому ж контексті є дослідження впливу на зміст освіти та виховання цивілізаційних змін, відображення та узагальнення яких забезпечують різноманітні форми духовно-практичного освоєння світу — наука і релігія, мистецтво і мораль, філософія та ін. Зміст освіти викристалізовується в горнилі їх органічної взаємодії. Аналіз цього процесу на широкому фоні загальнолюдської історії допоможе суспільству усвідомити ідеал, до якого ми прагнемо і який намагаємось реалізувати.

Завдання розвитку освіти, її облаштування у відповідності з викликами часу, було й залишається актуальним у всі історичні часи для всіх наро-

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дів і культур світу. Щоб бути цивілізованими, люди мають бути освіченими, культурними, вихованими у самому широкому розумінні цих понять. Задля цього вони створювали й розвивали такі форми духовно-практичного осягнення світу, як наука і мораль, релігія і мистецтво, політика і т.ін. Їх надбання, посилені соціально-культурним досвідом, через освіту та виховання передавались підростаючим поколінням, які в міру їх освоєння та в контексті можливостей епохи входили в життя, утверджувались в ньому як суб'єкти історичної діяльності.

Звичайно, в різні історичні часи і в різних народів означене завдання вирішувалось по-різному. Нерідко воно відсовувалось на другий чи третій план, делегувалось тільки соціально верхнім верствам населення, здійснювалось як насильство над особистістю. Однак, більшою мірою історію характеризує закономірність упорядкованої (для свого часу) організації освітньо-виховного процесу, який зрештою забезпечував підготовку розумних, дієздатних особистостей, що вели за собою маси людей й разом з ними рухали вперед історію, створювали й відтворювали її нові й новітні цивілізаційні формоутворення.

Історія твориться розумом і працею людей — вільних і підневільних, рабовласників і рабів, патриціїв і плебеїв, героїв і простолюдинів. Міра (і характер) участі в цьому процесі кожної з перерахований груп, звичайно, різна. Вона визначається, насамперед, умовами їх соціального буття. Але не тільки. Значною мірою ця участь обумовлена рівнем отриманої ними освіти та культури. Історія засвідчує, що людина освічена й вихована піднімається до висот повноформатного осягнення історії, досягає прозорого бачення майбутнього й одночасно, повертає, дарує їй (і утверджує в ній) духовно світле, гуманістичне, перспективне. Сформовані просвітництвом, духовно-гуманістичні ідеї та погляди розгортають горизонти цивілізації й одночасно забезпечують її якісну вищість і історії. Й оскільки подібні ідеї оволодівають людьми як відлуння загального духу цивілізації (через науку, культуру, релігію, мораль та інші форми духовно-практичного освоєння світу), насамперед, завдяки освіті і вихованню, саме цей феномен ми розглядаємо як один з основних чинників цивілізаційного розвитку людства.

Роль освіти (просвітництва) і виховання підростаючих поколінь в історичному поступі цивілізацій була незаперечною, але різною. Власне, такою ж вона є і в наші дні. Навряд чи знайдемо батьків (окрім маргінальних верств населення), які б не прагли дати власній дитині належну освіту і виховання. Разом з тим, при реалізації цього завдання позиції людей різняться. Нерідко їх бажання стримується нестачею коштів. Дехто ратує лише за елементарний (початковий) рівень освіти як ніби-то достатній для повноцінного життя в соціумі. Третій «влаштовує» свою дитину в найбільш престижний університет або ж посилає її на навчання за кордон, вважаючи, що саме там вона отримає те, що виведе її на верхні поверхи суспільної ієрархії. Однак, незалежно від експектацій, з якими люди підходять до формування системи освіти, ланцюг «людина-освіта-культура-цивілізація» від найдавніших часів і до наших днів не тільки не послаблюється, але й чим більш зміцнюється.

Цивілізаційними називають суспільства, якісна характеристика яких визначається духом гуманізму і людяності.

Щоправда, перші дослідники цивілізації (Гумбольт, Данилевський, Мірабо, Сорокін, Тойнбі, Адам Фергюсон, Февр та ін.) на передній план виводили такі показники, як соціальна стабільність та самоорганізація, матеріальна забезпеченість, упорядкованість форм спілкування людей, рівень суспільних досягнень тощо. Разом з тим, кожен з них більшою чи меншою мірою ідентифікував цивілізаційний процес з усвідомленням місця і ролі людини, глибиною і якістю осмислення нею власної присутності в ньому, розвитку її самосвідомості, духовності та моралі. Становлення таких суспільств пов'язується з завершенням періоду варварства, який знаменується появою писемності (Морган), розподілу праці та класів (Енгельс), виникнення ремесел, формуванням малих та великих міст тощо. *Головною ж ознакою цивілізації поступово викристалізувалось розуміння порядку, в якому людина постає не тільки як дійова особа — суб'єкт соціальних змін, але й як «міра всіх речей» (Протагор) — самоцінна особистість, міра розвитку духовності і культури.* «. . . Цивілізація починається там, — зазначає О. Пахльовська, — де є повага до людини, до її прав, її потреб» (О. Пахвальська. Ave Europa! — К., 2008. — С. 254).

Здавалося б, це положення особливих заперечень не викликало. Однак впродовж епох воно втілювалось в життя вкрай суперечливо і непослідовно. На ранніх стадіях цивілізаційного розвитку людства означене розуміння делегувалось лише панівним класам; раби, якими ставали боржники, бранці (полонені) на полях воєн, покарані злочинці, покинуті діти, діти рабів тощо, під поняття «людяності» не підпадали й сприймались, скоріше, як «знаряддя, що розмовляє» (Аристотель). До часу написання Біблії рабство було вже добре встановленим суспільним інститутом й існувало в усіх більш-менш розвинених країнах світу.

Історики вирізняють декілька етапів у розвитку цивілізації. Критеріями їх еволюції пов'язуються, насамперед, з матеріальними досягненнями людей. І це зрозуміло. Досягнення в сфері матеріальної культури є загально зримим свідченням прогресу. Духовні надбання, за правило, розглядались лише як чинники другого, або ж, навіть, третього порядку й здебільшого у розрахунок не приймались. Розмова про їх значення в житті людини, а відтак — у визначенні якості самого життя, велась похапцем, поверховим чином. Між тим, з розвитком історії, а в її лоні — науки і філософії, релігії і моралі, все більш яскраво викристалізовувалось прозрінням, висловленим у свій час знаменитим Мойсеєм у зверненні до іудеїв: «не хлібом єдиним живе людина, але всяким словом, що виходить із уст господа» (Второзаконня, 8,3). Людство все більш навертplos до висновку про те, що людина не може задовольнятись лише матеріальним; вона має духовні запити, які з розвитком історії все більш рельєфно заявляли про своє значення практично у всіх світових культурах. А це означає, що *велич цивілізації утверджується не тільки й не стільки матеріальним, скільки духовним чином:* будь які речі можуть створюватись людиною для людини, а можуть бути й «ворожими» щодо неї, підпорядковувати людину іншим людям, поневолювати її. Рівень (і якість) цивілізації у зазначених випадках є різним. Він визначається її (цивілізації) загальним духом, який формується й утверджується як світорозуміння людей

засобами духовно-практичного осягнення світу — наукою і релігією, культурою і освітою, мистецтвом і мораллю, політикою й рядом інших форм суспільної свідомості. Проникаючи в таїнство соціального й усвідомлюючи сенс життя — людсько-людяні форми співвідношення добра і зла, істини і справедливості — люди вибудовують свій спосіб його здійснення, створюють цивілізації, комфортні для одних й проблемні для інших. Ідея комфортної цивілізації «для всіх» (соціалісти-утопісти, марксизм) є не більше, як рожева мрія історії.

Форми духовно-практичного осягнення світу, наука, освіта і релігія і т.п., з одного боку, суттєво відрізняються між собою за предметом своєї рефлексії, метою, за для досягнення якої вони створювались, соціальною роллю, яку вони відіграють у суспільстві та формовиразами отриманого результату. Історія знає періоди органічної взаємодії цих феноменів, їх непримиренної ворожнечі, більш-менш поміркованого терпіння одного по відношенню до іншого (своєрідного мирного співіснування) й плідної співпраці, де результати, здобуті в лоні однієї з форм осягнення світу органічно доповнювались результатами іншої. Означені особливості закономірно відображалися в освіті, яка у різні часи делегувала (більшою мірою нав'язувала) особистості різноспрямовані пріоритети. ***Найбільш плідними (і людяними) періодами в житті людства були цивілізації, що формувались на засадах єдності означених форм, їх плідної взаємодії.***

Як особливі форми духовно-практичного осягнення світу означені феномени виникли на рубежі того історичного періоду, який К. Ясперс називає «осьовою віссю історії» (див.: «Духовна ситуація часу», «Філософська віра», «Витоки історії та її ціль»). Це — період між 800 і 200 роками до нашої ери. Йому передував розпад тисячолітніх культур, проникнення в сутність яких закрито непереборними нашаруваннями історичного часу. Як стверджують К. Ясперс і ряд інших дослідників начала людської історії (В. Алексєєв, Ю. Бромлей, Л. Морган, А. Тейлор, Д. Фрезер), в цей період жили, подорожували й дарували людям перли неперевершеної мудрості Заратустра і Магомет, виникали світові релігії, створювались перші філософські вчення та школи, оформлялись інтелектуально-освітні анклави людства. Великим учителем людства в цей час був знаменитий китайський філософ Конфуцій. Не виключаючи окремі сюжети, які спонукали до зіткнення та протистояння, можна констатувати, що релігія, наука і освіта (а разом з ними філософія, мистецтво, політика, мораль і т.ін.) в цей час існували в тісній взаємодії і взаємній доповненості.

Специфічною рисою первісної культури був її синкретизм (нерозчлененість), коли ні форми свідомості, ні види діяльності, ні форми культури не відділялися і не протиставлялися один одному. Будь-який вид діяльності передбачав і містив в собі всі інші. Це синкретизм супроводжував їх взаємодію на ранніх етапах осьового часу історії. Подальший розвиток цивілізації індивідуалізацію форм діяльності, а разом з ним і духовно-практичного осягнення світу поглиблював, а протистояння між ними — посилював. Своєрідною пограничною зоною, яка створювала можливості для співпраці, залишалась філософія. Однак, з часом навіть вона не могла упередити розмежування, яке поглиблювалось. Розум і віра, істина і

справедливість, а вслід за ними добро і красота все більшою мірою ставали одне для одного різними, чужими, а інколи й ворожими величинами. Можна собі тільки уявити, які концепти вони делегували в освіту, які виховні настанови «виписували» поколінням, які входили в життя!

Античність, що увійшла в історію як колиска людської цивілізації, базувалась на суперечливому співіснуванні форм суспільної свідомості. Поряд з філософією (як наукою), яка прагла добратись до істини, мирно співіснували міфологічні уявлення про богів і героїв, які за переконанням древніх мислителів, визначали розвиток історії (Зевс, Прометей, Ікар, Геракл та ін.). Спираючись на означені уявлення, тогочасна література (Гомер) формувала естетичні і моральні цінності людей, закладала підвалини просвітництва; моральна філософія обґрунтовувала принципи виховання підростаючого покоління. А в своїй єдності вони утверджували ідеал людини (досконалої як фізично, так і духовно), дух єдності людини і природи, необхідності її пізнання, досягнення порядку, основаному на законах. Основою такого способу життя визнавався розум, людська мудрість, на зміцнення яких «працювали» всі форми духовно-практичного осягнення світу. Зрозуміло, все це делегувалось вільній людині, рабовласнику. Жінки та раби, які за переконанням Аристотеля, не могли бути громадянами в силу власної природи, залишались за межами ідеалу, а відтак — за межами суспільного добробуту та комфорту.

Єдність і односпрямованість, здавалося б різнопланових духовних формоутворень, які переломлювались в освітньо-виховній системі античного світу, сформували ідеал людини, який з часом утвердився як основа педагогіки гуманізму, пізніше — як генотип педагогічної традиції Західної цивілізації — ідею всебічного розвитку особистості, її освіченості й культури, фізичної і моральної досконалості. Центром цього ідеалу був розум.

Занепад античної цивілізації розпочався з усвідомлення обмежених можливостей розуму. Як (помилково?) вважали древні мислителі, «людський розум» не здатен «зняти покривало з божественного лику Ізіди» (Геракліт) (див.: П'єр Адо. Покривало Ізіди. Нариси історії ідеї Природи. — К., 2016), «охопити природу», проникнути в її суть, а відтак — створити духовну платформу комфортного, забезпеченого життя. Осягнення природи («лику Ізіди-Артеміди») вони делегували мистецтву. Як показав подальший хід історії, первісні уми людства практично не помилялись. Однак, повне прозріння, а з ним і віра в безмежну силу розуму, наступить через півтора тисячоліття. Дорога до «віри в силу розуму» й утвердження першочергового значення освіти та виховання людини пролягала через Просвітництво та Ренесанс. Цивілізаційну оцінку їх досягнень дав І. Кант. А відповідальність за відродження авторитету розуму взяв на себе Гегель.

Це буде потім, а зараз — склалось так, як склалось. «На допомогу» розуму люди «покликали» Бога. Європейський світ увійшов у тривалу й суперечливу стадію середньовіччя — період цивілізаційного розвитку від V століття (падіння Римської імперії і Велике переселення народів) до епохи Відродження та Реформації, кінець XV століття — початок XVI століття. Його дух формувався через розходження (розбіжність) і супере-

чність між основними формами суспільної свідомості й утвердження авторитету релігії. Наука, філософія, мораль втрачають свій автономний статус (і авторитет!), який вони мали в період античності, й стають *прислужницями теології*. **В заміну авторитету розуму утверджувався авторитет віри.** «Не повіриш — не зрозумієш», зазначав один із найзначніших представників релігійної *філософії*. Аврелій Августин (354–430 рр. н.е.). Відлунням теологічного повороту духовного розвою цивілізації стало утвердження освіти, основною платформою якої було вивчення Біблії.

Довгий час у суспільстві панувала думка, що засноване на домінантах релігійного духу середньовіччя є періодом занепаду цивілізаційного розвитку людства. Нині подібний погляд переосмислюється. Поза всяк сумнівом, релігія внесла свій контраст у розвиток цивілізації, однак, не скільки обмежила його, скільки канонізувало в контексті власного світосприйняття і світорозуміння як божественного. Вона переслідувала науку, відторгала філософію, нав'язувала суспільству естетичні смаки й моральні норми, обмежувала свободу вибору, підпорядковувала порядку, обумовленому «божественними настановами» (всесилля інквізиції, спалення Дж. Бруно, переслідування М. Коперніка та ін.). В той же час, у лоні монастирів проводились наукові дослідження, формувались перші університети, визрівали вчення, які довгий час слугували (а в багатьох випадках слугують і понині) змістовно-визначеним суспільним ідеалом для людства. Такі знаменитості, як Августин Блаженний, Ансельм Кантерберійсський, Томас Аквінський та ін. подарували людству вчення та настанови, які збагатили цивілізацію духовно, морально і естетично.

Епоха Відродження та Ренесансу, які повернули людині довіру до людини та розуму, обгрунтували незаперечну роль науки та просвітництва (що нині розглядається як грандіозний прорив у майбутнє), і одночасно сформували так званий «атеїстичний світогляд» (що є не менш вагомою похибкою епохи), який впродовж років і десятиліть (особливо у варіанті атеїстичного більшовизму в Росії XX століття), руйнував загальнокультурні надбання релігійної цивілізації середньовіччя. Щоправда, цей світогляд системно і наполегливо «повертав до життя» такі ж традиційні (як і релігія) форми суспільної свідомості, як наука і філософія. Особлива роль цей час приділяв розвитку освіти і просвітництва.

Наступні епохи суттєвих інновацій в архітектоніку організації духовної еволюції цивілізації практично не внесли: філософія і наука, релігія і мораль, мистецтво та інші форми духовно-практичного осягнення світу рухались власними траєкторіями. Інколи вони перетинались — доповнювали рекомендації одне одного, однак здебільшого — розвінчували, заперечували, викривали, ворогували.

Особливу войовничість виявив марксистський войовничий атеїзм. Його філософія та практика, реалізована в післяреволюційній Росії, відкрила «ящик Пандори», чим породила такий сонм суперечностей духу, яких людська цивілізація ще не знала.

Сформовані на засадах войовничого атеїзму рекомендація для освіти та виховання наступних поколінь важко назвати «духовними». Вони відтворюють ворожнечу між народами, пропагують нічим не необмежений

вождизм, зневагу до загальнолюдських цінностей. Саме на атеїстичних засадах сформувалась держава, яка еволюціонувала в тоталітаризм, нав'язала фальшоване однодумство, моноідеологізм, зневагу до людини як особистості. У різні часи в СРСР були створені товариство «Спілка войовничих безвірників» (1925), видавалась газета «Безбожник» (1922–1941), журнали «Безбожник» (1925–1941), «Атеїст» (1922–1930), «Войовничий атеїзм» (1931) та ін., виходили атеїстичні журнали «Наука і релігія» (з 1959) та «Людина і світ» (з 1965). У всіх закладах освіти, від дитячого навчального закладу, школи і університету було запроваджено бесіди та навчальні курси з «Основ наукового атеїзму». Велася підготовка кадрів пропагандистів атеїзму на спеціальних атеїстичних факультетах вечірніх університетів марксизму-ленінізму, у гуртках тощо. Характерно, що їх продовжує і поглиблює правонаступниця колишнього СРСР — сучасна Росія. Залишки войовничо-атеїстичного погляду на світ є відчутним й в сучасній Україні.

Спектр відносини мислителів до релігії і науки різноманітний. І. Г. Гегель, зокрема, підкреслював первинну роль філософії. Релігію та науку він вважав вторинними формами свідомості; Ф. Ніцше був досить критичний і до релігії, і до науки, і до філософії; Б. Рассел сповідував, скоріш, атеїстичний погляд на світ, філософію ж ставив нижче науки, якій повсякчас віддавав незаперечне первенство; М. Хайдеггер звеличував філософію, критикував науку, поміірковано ставився до релігії. В той же час, такі філософські авторитети, як А. Бергсон, А. Н. Уайтхед, К. Ясперс, М. А. Бердяєв вважали релігію вищої духовною цінністю.

Слід мати на увазі, що *атеїстична ідеологія та практика більшовицької Росії суперечила сформованій на глибокій вірі в людинолюбство українській духовній традиції.* Радянський період в житті українців позначений радикальними протиріччями: влада знімала хрести й руйнувала Храми, а люди молились й просили у Бога прощення; у дні релігійних свят партійні керівники заганяли людей на «суботники», люди ж, відбувши офіційно визначену повинність, відзначали їх за домашніми кухонними столами; державна освітня політика насаджувала безапеляційний атеїзм, люди ж зберігали й читали своїм дітям Біблію й інші релігійні книги, за якими долучали дітей до глибокої і розмаїтої культури релігійного досвіду, пестували одвічно людські цінності — віру, надію і любов. Радянська імперія все більш віддалялась від Бога (і людини) й трагічно наближалась до царства зневіри в ці одвічно цивілізаційні цінності. Далеко не випадково у виступі перед Національною асоціацією євангелістів США у Флориді 8 березня 1983 президент Рейган охрестив СРСР «Імперією зла» (а також «центром Зла в сучасному світі») і оголосив своїм головним завданням боротьбу з ним.

Цивілізований світ жив за іншими нормами та правилами. Наука і релігія в ньому розглядались як взаємно доповнюючи форми суспільної свідомості, які не тільки не протиставлялись одне одному, але й заохочувались до співпраці. В основі цієї співпраці лежала проблема людини, сенсу її життя у світі, система цінностей, яка б спонукала до прогресивного розвитку. Західний світ не заперечував буття Бога й одночасно визнавав можливість прориву у незвідане засобами науки та просвітництва. Він дотримувався моральних настанов Біблії й одночасно поважав моральні пріоритети та

цінності, що народжувались у лоні повсякденного досвіду громадянського суспільства. Він дотримувався настанов на потойбічне життя й формував духовні підвалини життя реального, цьогосвітнього.

Знаковим стала заява британсько-американського філософа і математика Альфреда Уайтхеда («Религия в созидании», «Процесс и реальность»), про те, що наука і релігія аж ніяк не є ворогуючими сторонами духу; вони прямують до однієї й тієї ж істини, тільки різними шляхами! За думкою вченого, релігія є найбільш глибоким зрізом людської суб'єктивності.

Здавалося б, подібна заява не несе нічого принципово нового. Адже прагнення поєднати зусилля науки і релігії виявляли такі знаменитості, як У. Оккам і Н. Коперник, Г. Галілей, Р. Декарт, Г. В. Лейбніц, Б. Паскаль, Леонардо да Вінчі, Л. Пастер, П. Тейяр де Шарден та багато інших представників філософії, науки та релігії різних років і народів. І. Р. Пригожин і І. Стенгерс обгрунтовують висновок про своєрідний резонанс, взаємне посилення означених форм суспільної свідомості, який викликав вибух наукової творчості в XVII в. Цю платформу посилюють Ю. Боженський, К. Войтила, Є. Жільсон, Є. Коре, Ж. Марітен та ін. представники такого філософського напряму, як неотомізм (`http://pidruchniki.com/12800528/ filosofiya/osnovni_ideyi_neotomizmu`). До речі, висновок про плідність їх взаємодії підтвердили представники Римського клубу в грудневій доповіді 2017 року (див також: Э. Жильсон. Философия в средние века. — М., 2004).

Для справедливості зазначу: великі групи людей — як віруючих, так і атеїстів — існували (й існують у наші дні) по обидві сторони Великого океану. Щоправда, перші з них служать Богу і Людині. Кому і яким чином служать представники іншого світогляду — читач може здогадатись самостійно. . .

. . .В день Св. Кирила і Мефодія студентство Національного педагогічного університету імені М. П. Драгоманова звернулось до настоятеля Храму Св. Володимира, патріарха всієї України–Руси Св. Філарета з проханням провести богослужіння, гідне величі дійства святих апостолів. Ректор університету віддав відповідне розпорядження, яким визначив свободу участі кожного й одночасно перенесення ранкових годин навчання на більш пізній час. Студенти прийшли до Храму. Яке ж було здивування молоді, коли перед його входом їх зустріли декілька молодиків «атеїстів-чорносорочечників», які крикливо й прикриваючи обличчя листівками опротестовували богослужіння. Далі послідували звернення так званих активістів до галузевого міністерства, Народних обранців, уповноваженого з прав людини Верховної Ради. . . Суть звернень проста: «церква відокремлена. . . », «ректор примушує. . .», «релігія — це зло. . . » і т. д і т.п. Культурою світоглядного дискурсу, толерантністю і повагою до іншої точки зору «чорносорочечники» не вирізнялись. Просвітлення науками й досвідом історії вони не мали. Національними та загальнолюдськими цінностями не переймались. Так звані «активісти» переслідували тільки одне — відпрацювання коштів, виділених «доброзичливцями» для зриву гуманно-виховної акції. Пізніше я зрозумів, ця їх протест був ні чим іншим, як проявом гібридної війни, яку веде Росія проти України, а тому не може

залишитись поза увагою громадськості.

Формування справжньої а не позірної духовності, яка б супроводжувала нас у входження до Храму добра і справедливості, людинолюбства, відповідальності і порядку є завдання актуальним, невідкладним і довготривалим. В його основі має знаходитись досвід національної та світової історії, дійсний перебіг якої треба дослідити належним чином.

Саме в цій ситуації виникає питання: так в чому ж суть духовної еволюції цивілізації і яке місце в ній займає феномен освіти; який висновок і пораду ми — люди XX століття — залишимо поколінням, які йдуть на зміну? Коротко на це запитання можна відповісти так: в своєму духовному розвої людство рухалось від синкретизму до протистояння, від домінанти однієї з форм духовно-практичного освоєння світу до їх взаємної доповнюваності і співпраці. Головним перспективним завданням людства є завдання утвердження нового світу разом, на нових цінностях, новій духовній платформі. За висновками членів Римського клубу, цивілізація потребує нового просвітництва, формування та впровадження принципово нової моделі організації освіти. Це ж питання є першочерговим і для України. Не відстороюючи на другий план необхідність відродження виробництва, створення робочих місць, подолання бідності і т.д., ми ще раз наголошуємо: *корінь вирішення проблем цивілізаційного розвитку України знаходиться в освіті та вихованні, які має забезпечити повернення людей, у лоно розуму і творчості, високої духовності і моралі, формування потреби творити добро для людини і суспільства.*

Цікавою і продуктивною у цьому контексті є думка Гаррі Джейкобса — Головного виконавчого директора Всесвітньої академії мистецтв та науки (WAAS), Голови ради консорціуму світових університетів, бізнес-консультанта, письменника і дійсного члена Римського клубу (Каліфорнія): «Україні значно важливіше . . . розвинути ваш людський ресурс. Вам вкрай необхідно змінити свій підхід до освіти. Маєте розвивати людей, щоб вони не були слухняними членами «комуністичної системи». Щоб ваші працівники ставали підприємцями. Щоб бізнесмени були інноваторами. Люди в Україні мають вчитися думати. Це те вміння, якого вас з великою кров'ю — через колективізацію, репресії та штучний голод — позбавляв Радянський Союз. Ось де ваш «вихід». Якщо вам вдасться *змінити систему освіти* (виділено авт.), політика зміниться. Наступне покоління українців не потребуватиме іноземних компаній. Вони самі будуть кращі за них. Ви дуже розумна нація». (Див.: Алла Дубовик. Де «вихід»?//День № 58, вівторок 3 квітня 2018 р.).

За моїм переконанням, наука рано чи пізно «скине покривало з Ізиди» й покаже нам природний світ таким, яким він є у дійсності; релігія виведе наше пізнання за межі трансцендентального (наявного пізнавального досвіду); мистецтво відкриє для кожного велич божественної краси; мораль зрештою приведе людство у царство добра і справедливості. Полем їх органічної єдності і пізнанні світу і людини, у формуванні цілісного світогляду як основи і навігаційної домінанти становлення особистості, її дієздатного входження в життя, постане освіта. Людина створить гармо-

нійний світ, про який мріяли найбільш потужні уми цивілізації і передасть цю мрію наступним поколінням. Українці мають очолити цей процес, захистити світ від руйнації, повернути його розвиток у духовно спрямоване річище. Адже ми — нація гуманітарна і гуманістична, розумна і працьовита, духовна і відповідальна перед історією, перед поколіннями, які пішли в історію й перед молоддю, якій належить майбутнє. «Кожному поколінню, — писав знаменитий А. Камю, — притаманним є бажання змінити світ. Моє, між тим, уже знає, що світ воно не переробить. Однак, його завдання, можливо, є ще більш важливим. Воно полягає у тому, щоби завадити світу зникнути» (А. Камю. Творчість і свобода. М., 1990. — с. 175).

Математика

Mathematics

Forgotten motives:
the varieties of scientific experience

Yuri Manin[1]

> *Le gros public:*
> A poêle, Descartes! à poêle!
>
> *R. Queneau, Les Oeuvres*
> *complètes de Sally Mara*

When I arrived in Bures-sur-Yvette in May 1967, the famous seminar SGA 1966–67, dedicated to the Riemann–Roch theorem, was already drawing to an end. Mlle Rolland, then Léon Motchane's secretary at the IHÉS, found for me a nice small apartment in Orsay. Each early morning, awoken to the loud chorus of singing birds, I walked to Bures, anticipating the new session of private tutoring on the then brand-new project of motives, by the Grand Maître himself, Alexandre Grothendieck. Several pages, written by his hand then, survive in my archive; in particular, the one dedicated to the "Standard Conjectures". These conjectures remain unproved after half a century of vain efforts. Grothendieck himself saw them as the cornerstone of the whole project. In the letter to me dated March 20, 1969, he wrote:

> *Je dois avouer à ma honte que je ne sais plus distinguer à première vue ce qui est démontrable (voire plus ou moins trivial) sans les conjectures standard, et ce qui ne l'est pas. C'est évidemment honteux qu'on n'ait pas démontrées les conjectures standard!*

Still, during the decades that have passed since then the vast realm of motives kept rewarding the humility of many researchers prepared to be happy with what they could do using the tools they could elaborate.

Several times Grothendieck invited me to his house at rue de Moulon. He allowed me to browse through his bookshelves; I borrowed a few books to read at home. When I last visited him a day or two before my departure, I asked him to sign a book or paper for me. To my amazement, he opened "Les Œuvres complètes de Sally Mara" by Raymond Queneau and scribbled on the first page:

Hommage affectueux R. Queneau

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Early history of motives

Having returned to Moscow in June 1967, after five or six weeks of intense training with Grothendieck, I spent several months writing down his main definitions related to motives and studying necessary background material in the literature. I was very pleased when it turned out that I could answer one of his questions and calculate the motive of a blow-up without using standard conjectures. My paper [Ma68] containing this exercise was submitted next summer and published in Russian. It became the first ever publication on motives, and Grothendieck recommended it to David Mumford (in his letter of April 14, 1969) as *"a nice foundational paper"* on motives.

Grothendieck wrote a letter in Russian to me about this paper (05/02/1969). This seems to be the only document showing that he had some Russian, probably, learned from his father.

The first step in the definition of a category of (pure) motives is this. We keep objects of a given algebraic-geometric category, say of smooth projective varieties over a fixed field Var_k, but replace its morphisms by *correspondences*. This passage implies that morphisms $X \to Y$ now form an *additive group*, or even a K-module rather than simply a set, where K is an appropriate coefficient ring. Moreover, correspondences themselves are not just cycles on $X \times Y$ but *classes* of such cycles modulo an "adequate" equivalence relation. The coarsest such relation is that of numerical equivalence, when two equidimensional cycles are equivalent if their intersection indices with each cycle of complementary dimension coincide. The finest one is the rational (Chow) equivalence, when equivalent cycles are deformations over a base which is a chain of rational curves. Direct product of varieties induces tensor product structure on the category.

The second step in the definition of the relevant category of pure motives consists in a formal construction of new objects (and relevant morphisms) that are "pieces" of varieties: kernels and images of projectors, i. e. correspondences $p : X \to X$ with $p^2 = p$. This produces a *pseudo-abelian*, or *Karoubian* completion of the category. In this new category, the projective line $\mathbf{P}^1$ becomes the direct sum of the (motive of) a point and the Lefschetz motive $\mathbf{L}$ (intuitively corresponding to the affine line).

The third, and last step of the construction, is one more formal enhancement of the class of objects: they now include *all* integer tensor powers $\mathbf{L}^{\otimes n}$, not just non-negative ones, and tensor products of these with other motives.

Various strands of intuition are interwoven in this fundamental pattern discovered by Grothendieck, and I will now try to make them (more) explicit.

The basic intuition that guided Grothendieck himself, was the image of the category of pure Chow motives Mot_k as the receptacle of the *"universal cohomology theory"* $V_k \to Mot_k : V \mapsto h(V)$. The universal theory was needed in order to unite various cohomological constructions, such as Betti, de Rham-Hodge, and étale cohomology.

What looked paradoxical in this image was the following observation about transcendental cycles on an algebraic variety X. One could get hold of these cycles for $k = \mathbf{C}$ by appealing to algebraic topology, or else to complicated constructions of homological algebra involving all finite covers of X.

But in the category of pure motives, from the start one dealt *only* with algebraic cycles, represented by correspondences, and it was intuitively not at all clear how on earth they could convey information about transcendental cycles. Indeed, the main function of the "Standard Conjectures" was to serve as a convenient bridge from algebraic to transcendental. Everything that one could prove without them was indeed *"plus ou moins trivial"* — until people started treating correspondences themselves using sophisticated homological algebra (partly generated by the development of étale cohomology and Grothendieck–Verdier's introduction of derived and triangulated categories).

However, the passage from the set of morphisms to the K-module of correspondences involves one more intuitive idea, and it can be most succinctly invoked by referring to *physics*, namely the great leap from the classical mode of description of nature to the quantum one. This leap defined the science of the XXth century. Its basic and universal step consists in the introduction of a *linear span* of everything that in classical physics was only a set: points of a phase space, field configurations over a domain of space-time etc. Such *quantum superpositions* then form linear spaces on which Hilbert-like scalar products are defined, that in turn allow one to speak about probability amplitudes, quantum observations etc.

I have no evidence that Grothendieck himself thought then about quantum physics in relation to his algebraic geometry project. We do know that concerns about weapons of mass destruction and collaborationist behaviour of scientists towards their governments and military-industrial complexes inspired in him deep disturbance and aversion. The most direct source of his inspiration might have been algebraic topology which, after the 1940s, laid more stress on chains and cochains than on simplices and the ways they are glued together.

However, in my personal development as a mathematician in the 1970's–80's and later, the study of quantum field theory played a great role, and feedback from theoretical physics — that was ahead — to algebraic geometry became a great source of inspiration for me. I was and remain possessed by a Cartesian dream, poetic rationalism, whatever history has yet to say about *Der Untergang des Abendlandes*.

Below I will sketch a map of two branches of the development of Grothendieck ideas about motives that approximately followed two intuitions invoked above: from homological algebra and from physics respectively. The references at the end of this essay constitute the bare minimum of the relevant research, but the reader will be able to find much additional bibliographical material in the survey collection [Mo91] and in [A04], [VoSuFr00], [Ta11].

Motives and homological algebra

The most common linear objects are modules over rings in algebra and sheaves of modules in algebraic geometry. *Free modules/locally free sheaves* are the closest to classical linear spaces.

General algebraic variety X, or a scheme, is a highly non-linear object.

In classical algebraic geometry over, say, the complex numbers, the variety X used to be identified with the topological space $X(\mathbf{C})$ of its $\mathbf{C}$-points, and could be studied by topological methods involving triangulations or cell

decompositions. In the geometry over, say, finite fields, this did not work, and when in 1949 André Weil stated his famous suggestion that point counting over finite fields should be done using trace of the Frobenius endomorphism acting upon appropriately defined (co)homology groups of X, it generated a flow of research.

The first product of this research was the creation of the cohomology theory of coherent sheaves of modules $\mathcal{F}$ on varieties X or more general schemes. Now, in a constructive definition of $H^*(X, \mathcal{F})$, one could either stress combinatorics of covers of X by open sets in the Zariski topology (Čech cohomology) or, alternatively, "projective/injective resolutions" of $\mathcal{F}$, that is special exact complexes of sheaves $\ldots \to F_2 \to F_1 \to F_0 := \mathcal{F} \to 0$ or similarly with arrows inverted. This passage from the dependence of $H^*(X, \mathcal{F})$ on the non-linear argument X to the dependence on the linear argument $\mathcal{F}$ was very characteristic for the early algebraic geometry of 1950's and 1960's. "Homological Algebra" by H. Cartan and S. Eilenberg, the famous FAC, "Faisceaux Algébriques Cohérents" by J.-P. Serre, became the standard handbooks for every aspiring young algebraic geometer.

David Mumford and I started our training as algebraic geometers at the same time, about 1956, he at Harvard, I at Moscow University. David reminisces that his teacher Zariski "was motivated by the need to make the work of the Italian school rigorous by using the new methods of commutative algebra". My teacher Shafare-vich also suggested to us to study glorious Italian algebraic geometry, approaching it armed with modern insights and techniques developed by Serre, Grothendieck and their school.

I had no time nor use for a course in "Instant Italian", so I tried to read two books simultaneously, "Le Superficie Algebriche" by Federigo Enriques (Zanichelli, 1949) and "La Divina Commedia", and each time that I opened Enriques (or for that matter, SGA), I recited mournfully: *lasciate ogni speranza voi ch'entrate...*

Nevertheless, it worked. When I brought xeroxed papers by Gino Fano back from Bures in 1967, Vassya Iskovskikh and I could read them without bothering much in which language they have been written, and then produce the first examples of birationally rigid varieties, and unirational but not rational threefolds using Fano methods.

Homological algebra proved more resistant, and here I learned most of what I understand now from the next generation of eager young Moscow students, who by now have been mature researchers themselves for a long time.

We first learned, of course, about the basic Grothendieck–Verdier presentation of homological algebra as the theory of derived, and more generally, triangulated categories. Passage from the Bourbaki language of structures to the now domineering language of categories (and then polycategories) involved several radical changes of intuition, and as is now clear, led into the garden of forking paths. The passage from one crossroad to another one always involved a decision about what should be disregarded, and later it could happen — and always did happen — that one was bound to turn back again and recollect some forgotten ideas.

The story of *derived categories* started with categories, whose *objects* were complexes (of abelian groups/sheaves/objects of an abelian category) considered modulo homotopy.

In the framework of Grothendieck–Verdier triangulated categories, one forgot about initial objects-complexes and focused on an abstract additive category, endowed with a translation functor and a class of diagrams, called distinguished triangles. But the problem of non-functoriality of cones led back to the complexes of abelian groups, this time upgraded to the level of *morphisms* rather than objects.

This was, of course, a special case of *enriched categories*, which in the simplest incarnation postulate Bourbaki-structured morphism sets $\text{Hom}(X, Y)$, but with an upgrading: this time one clearly had to deal with the case of *categorified* morphism sets. However, when one allows morphisms to be objects of a category, then morphisms of this second floor category might form a category as well ... and we find ourselves ascending the Tower of Babel that could cause despair even in Grothendieck himself.

For the limited purposes of this note, I will disregard subtleties and various versions of the notion of triangulated/dg-categories, and will only sketch several basic discoveries of the last decades relating such categories with motives.

Roughly speaking, starting with a category of varieties (or schemes) X, one may consider either the replacement of each X by a triangulated category $D(X)$ of complexes of (quasi)-coherent sheaves on X, or else return to the initial Grothendieck insight, but replace correspondences by *complexes of correspondences*.

The latter approach led to the Voevodsky's motives ([VoSuFr00]). I will focus on some achievements of the first one.

One of the first great surprises was Alexander Beilinson's discovery ([Be83]) that a derived category of a projective space can be described as a triangulated category made out of modules over a Grassmann algebra. In particular, a projective space became "affine" in some kind of non-commutative geometry! The development of Beilinson's technique led to a general machinery describing triangulated categories in terms of exceptional systems and extending the realm of candidates to the role of non-commutative motives.

D. Orlov ([Or05]) proved a general theorem to the effect that if X, Y are smooth projective k-varieties and if there is a fully faithful functor $F : D^b(X) \to D^b(Y)$, then the Chow motive $h(X)$ is a direct summand of $h(Y)$ "up to translations and twists by Lefschetz/Tate motives".

M. Kontsevich formalised the properties of *dg*-categories, expressing properness and smoothness in case of the derived categories of varieties, and defined the respective class of categories (modulo homotopy) as "spaces" in non-commutative algebraic geometry. He then defined the respective class of Chow motives and has shown that there exists a natural fully faithful functor embedding Grothendieck's Chow motives (modulo twists) into non-commutative motives. These ideas were further developed by Tabuada, Marcolli, Cisinski et al., cf. the recent survey [Ta11] and references therein.

Motives and physics

In the mid-1970's and later, algebraic geometry interacted with physics more intensely that ever before: self-dual gauge fields (instantons), completely integrable systems (Korteweg-de Vries equations), emergence of supergeome-

try (based upon formal rules of Fermi statistics), the Mumford form and the Polyakov measure on moduli spaces of curves (quantum strings) have been discussed at joint seminars and local and international conferences of physicists and mathematicians.

Motives did not yet appear in this picture. However, in 1991 something new and unexpected happened.

B. Greene in his book "The Elegant Universe. Superstrings, Hidden Dimensions and the Quest for the Ultimate Theory" tells the following story:

"At a meeting of physicists and mathematicians in Berkeley in 1991, Candelas announced the result reached by his group using string theory and mirror symmetry: 317 206 375. Ellingsrood and Strømme announced the result of their very difficult mathematical computation: 2 682 549 425. For days, mathematicians and physicists debated: Who was right? [...]

About a month later, an e-mail message was widely circulated among participants in the Berkeley meeting with the subject heading: Physics Wins! Ellingsrood and Strømme had found an error in their computer code that, when corrected, confirmed Candelas's result."

The problem about which Greene speaks is this. Consider a smooth hypersurface V of degree 5 in $\mathbf{P}^4$. Denote by $n(d)$ the (appropriately defined) number of rational curves of degree d on V. Calculating $n(d)$ looks like perfectly classical problem of enumerative algebra geometry, and in fact the numbers $n(1) = 2875$ and $n(2) = 609250$ were long known. The physicists Ph. Candelas, X. C. de la Ossa, P. S. Green, and L. Parkes using machinery and heuristics of quantum string theory, calculated not just $n(3)$, but gave an analytic expression for a total generating function for these numbers, using the so called Mirror Conjecture. The mathematicians G. Ellingsrood and S. A. Strømme produced a computer code calculating $n(3)$.

Omitting a lot of exciting developments of this rich story, I will briefly explain only the part that refers to the new and highly universal motivic structure that emerged in algebraic geometry. I will speak about varieties, although in fact Deligne–Mumford stacks form the minimal habitat for this structure, and the respective extension of the construction of pure motives for them is needed; this was done by B. Toën.

Roughly speaking, we now treat the general problem, inherited from classical enumerative geometry: given a projective variety V, (define and) calculate the number of algebraic curves of genus g on V, satisfying additional incidence conditions that make this number finite, as in the Euclidean archetype: "one line passes through two different points of plane". After considerable efforts, one can define for all stable values of g, n a Chow class $I_{g,n}$ on $V^n \times \overline{M}_{g,n}$ with coefficients in the completed semi-group ring, say $\mathbf{Q}[[q^\beta]]$ where β runs over integral classes in the Mori cone of V. This class expresses the virtual incidence relation, described above, by reducing it to the positions of the respective points in V^n on the one hand, and to the position of the respective curve in the Deligne–Mumford stack of curves of genus g with n marked points.

When this is done, a list of universal properties of the classes $I_{g,n}$ treated as motivic morphisms, defines essentially the (co)action of the modular

(co)operad with components $h(\overline{M}_{g,n})$ in the category of motives upon each *total* motive $h(V)$ (I use the word total in order to stress that we are not allowed to pass to pieces here, although twisting and translations are in fact present, cf. [BehM96]).

The sophistication of both theoretical (and imaginative) physics and abstract mathematics that cooperated to discover this picture is really amazing, and I would like to draw attention to the fact that our traditional (mis)representation of mathematics as a language and technical tool needed to make physical intuition precise, was reversed here: physical intuition helped discover mathematical structures that were not known before. One remarkable result of this was Deligne's generalisation of the Tannakian Galois formalism ([De02]): it turned out that motivic Galois groups are actually supergroups, so that the Fermi statistics now firmly resides in algebraic geometry as well, which up to then was "purely bosonian".

Of course, such reversals have happened many times in history, but here the contemporary status of both theory of motives and quantum strings adds a strong romantic touch to the story. The beautiful two-volume cooperative project of the two communities trying to enlighten each other, [QFS99], is branded by two epigraphs. The epigraph to the first volume is a quotation from Grothendieck's "Récoltes et Semailles":

Passer de la mécanique quantique de Newton à celle d'Einstein doit être un peu, pour le mathématicien, comme de passer du bon vieux dialecte provençal à l'argot parisien dernier cri. Par contre, passer à la mécanique quantique, j'imagine, c'est passer du français au chinois.

(In the pre-post-modern times one would have said: "It's all Greek to me!").

The second volume starts with epigraph, written in Chinese logograms, from Confucius' "Analects", 17:2. Here I give its translation:

The Master said: "Men are close to one another by nature. They drift apart through behavior that is constantly repeated".

This is the collective riposte of the two communities, arguing their closeness, but in the language that is foreign to both.

***

In his letter to me from Les Aumettes dated March 8, 1988, the last letter that I have, Grothendieck has written:

...thanks for your letter of birthday congratulations, and please excuse my being late in replying to this letter, as well as the previous one and thanking for the reprint with dedication of november last year. Your letter struck me as somewhat formal and kind of ill at ease, and surely my silence has contributed to it. What I had to say about the spirits in mathematics today I said in the volumes I sent you and a number of other former friends. I am confident that before the year 2000 is reached, mathematicians (and even non-mathematicians) will read it with care and be amazed about times strange at last left behind...

I met Grothendieck almost half a century ago. Thinking back on his imprint on me then, I realise that it was his generosity and his uncanny sense of humour that struck me most, the carnivalistic streak in his nature, which I later learned to discern in other anarchists and revolutionaries.

On the front cover of the issue no 14 of *"Survivre ... et Vivre" (Octobre–Novembre 1972)* that miraculously reached me by post in Moscow, I read:

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Соціологія

Sociology

Social justice as a subjective analysis category. Numerical estimations

Volodymyr Kasianov[1]*, Andrij Goncharenko*[2]

Introduction

The notion of *"Social Justice"* [1] is an object of the *"Theory of Collective Solutions Making"* [2], related to the *"Welfare Theory"* [3].

The term of: *"Social Justice"*, being an old notion, lately became extremely popular in some politicians speeches. Especially it is noticeable in the periods of election campaigns, political parties' discussions, politicians' statements.

Nevertheless, it can be definitely said that these people hardy imagine the sense of that category. Regular voters understand the meaning of *"Social Justice"* even weaker and mostly at the emotions level. Therefore, a successful literature formulation substitutes the core of the problem and leads the discussion on some other point.

The task for the authors, in the presented work, is to clarify, to some degree, the issue about *"Social Justice"* on the basis of the old theory of *"Collective Utility"* and proposed and developed by one of the authors *"Subjective Entropy Maximum Principle"* [4-6]. The latter is the keystone of the theory of *"Subjective Analysis"* [4-6] developed after the *"Jaynes' Entropy Principle"* [7, 8]. Hereinafter, we propose the method to analyze the problem numerically and investigate it parametrically.

The synthesis of the *"Utility Theory"* and *"Subjective Analysis"* opens new vision of the problem of *"Social Justice"*.

1) First of all there is an external view on the system; it is objective. If we say about a subjective component, we have to take into consideration the interaction of the socium participants.

2) Next up of the preliminary notes is that the term of *"Social Justice"* evidences about not only individual attitudes, but also their collective feelings, although all their evaluations arise inside the actors psych.

Individual estimations of the *"Social Justice"* criteria aggregate by specified rules into the collective estimations; also, in parallel to the individual and inside the individuals' psyches.

3) The *"Social Justice"* category is a dynamical one. This means that every time criteria variate. That is at the solution of the dynamical problems

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of the *"Social Justice"* a recursion methods are of significance. The time span of the recursion has to be selected with taking into account an entropy time, introduced and considered in the sequence of works related to entropy approaches [9, 10].

Thus, the synthesis of *"Collective Utility"* and *"Subjective Entropy Maximum Principle"* from *"Subjective Analysis"* leads to the variational problems with the additive functionals. The main member of such functionals is the *"Subjective Entropy"* depending upon the considered problem. Isoperimetrical conditions are formed with the help of the *"Effectiveness Function"* and *"Normalizing Condition"*. The *"Effectiveness Function"* each time is expressed through the so-called *"Cognitive Function"*.

Formulate the two principal variational problems.

Problem *"A"*: the *"Subjective Entropy"* is fixed at the specified level; and the *"Effectiveness Function"* is maximized. Since the *"Subjective Entropy"* characterize the degree of inequality, then it is possible to think that in this case the problem the *"Utilitarism"* is being solved.

Problem *"B"*: the value of the *"Effectiveness Function"* is fixed and the *"Subjective Rating Entropy"* is maximized. That is, in a rather general setting, the problem of the *"Egalitarizm"* is being solved.

The authors believe that in such formulation the notions of the *"Utilitarism"* and *"Egalitarizm"* are conditional.

In conclusion of this preamble part we would like to point that the *"Effectiveness Function"* is taken in such view than the principle of "anonymousity" is violated. Some formulas and calculations are presented in the second part. Some important questions were presented in the monograph by one of the authors, namely, entropy thresholds were introduced, entropy areas are not uniform, temperatures were introduced, analogs to some statistical mechanics give us the right to introduce the subjective temperatures, and in the framework of the suppositions many problems of *"Subjective Analysis"* were solved [4-6, 11-16].

The concept of social justice is an object of the decision making theory in a social group [2]. It is considered from the point of view of the "welfare theory" [3].

In accordance to Tokwill (1860) the tendency of a man to an equality is passionate, an eternal, and an irresistible (we can add here — never being realized).

If we say about a State in general, about its features, we can suppose that the State has no other problems besides of elaboration of some determined concept of social justice and to make all possible efforts to realize this concept. If some State has no concept of social justice, it is not a State at all.

Of course such a concept depends on the kind of State. Namely, a slave State has a concept of the social justice which is different from the concept of social justice of a Liberal State.

It is undoubtedly, the social justice is a purely subjective category. The domain of its existence is the brains of the individuals (subjects of the social group). Surely, this concept, as a certain informational object, has its own projection into the domain of the material existence of the socium groups: choice of aims, tasks, strategies, resources and so on.

From the said above it follows that we have the right to apply the methods of the *"Subjective Analysis Theory"* [4-6] to the solution of the whole problem for receiving the numerical estimation.

A concept of the social justice is an ethic category. There are two simplest and oldest concepts: *"Egalitarism"* and *"Utilitarism"*. In between of these marginal cases there are all other compromise cases.

More detailed information about theoretical basement could be found at the site: `http://kasianovv.wixsite.com/entropyofpreferences/thematics`

Theoretical Provisions Development

In the utility theory corresponding criteria were introduced: *"Function of Collective Utility"* [2], (FCU) $W(U)$, where U — utility.

$$U = (u_1, u_2, \ldots, u_M), \tag{1}$$

M — the number of the subjects in the group.

In the case of egalitarism FCU has a form

$$W_e(U) = \min_{j \in \overline{1,M}} u_j. \tag{2}$$

As an additional condition

$$u_{\min} < u_j < u_{\max}, \forall j \tag{3}$$

could be taken into account.

In this case an optimal strategy is the solution of the following extremal problem

$$\text{Str}_{\text{opt}} = \sup_{\text{Str} \in S} [W_e(U)] = \sup_{\text{Str} \in S} \left(\min_{j \in \overline{1,M}} u_j \right). \tag{4}$$

Egalitarism is a strategy when the poorest member of the group dictates the choice of the strategy of the group.

Egalitarism leads to the leveling of the utilities of all members of the group. But it does not require the full equality between the members. So, egalitarism means that the poorest member is the dictator. By the way, as a result of a revolution the revolutionary expropriation could be realized in accordance with the Pigot-Dalton principle. Such revolution may be named an egalitary one.

In the case of a utilitarism the following function of FCU should be chosen

$$W_u(U) = \sum_{j=1}^{M} u_j, \tag{5}$$

where u_j — individual utility of the group member.

Optimal utilitarian strategy will be found as the solution of the following extremal problem

$$\text{Str}_{\text{opt}} = \sup_{\text{Str} \in S} [W_u(U)] = \sup_{\text{Str} \in S} \left(\sum_{j=1}^{M} u_j \right). \tag{6}$$

It could be imagined another intermediate cases, for example, when

$$W(U) = \max_{k \in \overline{1,M}} u_k, \tag{7}$$

when

$$U_{\min} < u_k < U_{\max}. \tag{8}$$

In a more general case

$$W(U) = \frac{1}{M} \sum_{j=1}^{M} u_j. \tag{9}$$

Or we could take the FCU function in the form of

$$W(U) = \sum_{j=1}^{M} g_j u_j, \tag{10}$$

where

$$\sum_{j=1}^{M} g_j = 1. \tag{11}$$

Then besides of the FCU function it could be taken into account some additional condition. For instance, inequalities like the following

$$u_k \in \left[u_{k_{\min}}, u_{k_{\max}} \right); k \in \overline{1,M}, \tag{12}$$

or

$$W(U) = \sum_{j=1}^{M} u_j \xi_j, \tag{13}$$

where ξ_j — some ratings

$$\xi_j \in (0 \ldots 1); \left(j \in \overline{1,M} \right). \tag{14}$$

If ξ_j — rating coefficients, then they could be found as a solution of an extremal problem with the functional like Jaynes-problems functions, with the main term, rating entropy:

$$H_{\xi_j} = -\sum_{j=1}^{M} \xi_j \ln \xi_j, \tag{15}$$

which corresponds to the problem of the subjective equality.

We have to say here that the category of the "Social Justice" is an ethical category; and that is why we describe it in the terminology of Subjective Analysis.

If

$$H_\xi = H_{\max} = \ln M, \tag{16}$$

it corresponds to the complete (absolute) subjective equality.

Let us see how to imagine the requirements of equality in the terms of Subjective Analysis. Much more precisely, how to connect it with the main principle of Subjective Analysis — the Principle of the Subjective Entropy Maximum.

The entire (complete, absolute) equality could be expressed as an equality of the individual rating coefficient in a group. In this case

$$\xi_j = \frac{1}{M}, \tag{17}$$

for all subjects (each individual) and the entropy then equals

$$H_\xi = \ln M. \tag{18}$$

For all cases of inequality: not every $\xi_j = \dfrac{1}{M}$

$$H_\xi = -\sum_{j=1}^{M} \xi_j \ln \xi_j < \ln M. \tag{19}$$

We could write down the measure of the inequality as a following criterion

$$\boxed{\Phi_0 = \ln M - H_\xi = \ln M + \sum_{j=1}^{M} \xi_j \ln \xi_j.} \tag{20}$$

One of the very important parts of the social justice is the set of the requirements of the safety of each individual, so as the safety of the whole group.

The requirements of the safety could be expressed in the terms of the conflict theory. This theory has been developed in the form of subjective analysis [4-6]. In this theory any conflict is identified as a connection between distributions of preferences. In this case we should distinguish some different kinds of conflicts.

- Inner conflict — conflict between two preferences distributions produced by the same individual consciousness (self-conflict).

- Interpersonal conflict — conflict between distributions of preferences of the same kind, produced by different individuals on the same set of alternatives.

- Conflict between different groups of subjects (inter-group conflict).

- Cold conflict

- Hot conflict

- Object conflict — conflict between two distributions of object preferences.

- Subject conflict — conflict between two subjects or between two groups of subjects.

The optimization criteria is written in the form of

$$\Phi_\xi = H_\xi \pm \beta W + \gamma \sum_{j=1}^{M} \xi_j, \qquad (21)$$

where β and γ — the so-called structure parameters.

More detailed notation is

$$\Phi_\xi = -\sum_{j=1}^{M} \xi_j \ln \xi_j \pm \beta \sum_{j=1}^{M} \xi_j u_j + \gamma \sum_{j=1}^{M} \xi_j, \qquad (22)$$

where ξ_j — index of the absolute ratings.

Strictly speaking we have to define the subject, in whose brain this rating distribution is realized. In the opposite case we could not have used the *"Subjective Entropy Maximum Principle"*.

For example, it could be taken that the group contains $n+1$ subjects; one of which $j = k$ is the *"External Observer"*.

If we introduce conditional ratings $\xi(k \to j)$ — the rating of j in the eyes of k, we can receive a simple enough algorithm for solving the whole problem. A more detailed approach is presented in the monographs of [5, 6].

In this simple approach $u(j \to k)$ expresses the social justice interests for the entire socium. The theory gets certainty.

In [5, 6], the so-called *"Mutual Utility Theory"* has been developed. It can be used for further development of the given problem.
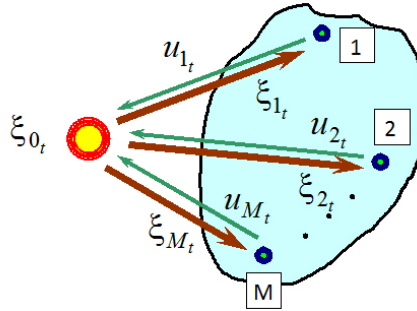
The situation is illustrated in Figure 1.

Fig. 1. — Relations of the *"External Observer"* with the evaluated group

Here we can use a supposition about existence of the thresholds of the characteristics mentioned above [6].

Several thresholds were introduced in [5]. First of all such thresholds define the levels of the entropy of a decision making — the choice of a strategy or alternatives. It is designated as H^*.

It means that two conditions are fulfilled:

1) $H_\xi \leq H^*$ at the time t^*.

2) $\dfrac{dH_\xi}{dt} < 0$ at the moment of t^*.

Secondly, it is supposed that another threshold H_{**} defines the level, down of which there is an area of the ratings utilitarism (dictator's regime).

At last there exist such a level of entropy that the only alternative seems to be available, and distribution of preferences becomes singular. In this case the state (condition) of psych could be named *"Zombie Level"*. It means by the way that there are no resources in the system in order to drive the psych of the subject out from this state.

Exceeding the other threshold level H_* puts the psych down into a hysteria if $H \geq H_*$.
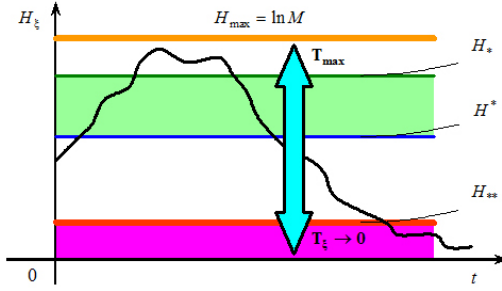
This is portrayed in stripes in Fig. 2.

Fig. 2. — Structure of the subjective entropy space

So, the domain (realm) of $[H_{\max}, H_*]$ is the domain of the psych stress state. The domain $(H_*, H^*]$ — realm of freedom, domain $(H^*, H_{**}]$ — realm of necessity, and at last the domain $(H_{**}, 0]$ — *"Zombie Domain"*. Let us repeat once again, that there are no possibilities to get individuals out of this domain.

In Fig. 2 it is shown the structure of the subjective entropy space and mutual positions of the corresponding thresholds. These positions depend upon the social temperatures.

In what way can we introduce the social temperature: $T_\xi = \beta_\xi^{-1}$?

The principle of the subjective entropy maximum gives the following distribution of the rating preferences:

$$\xi(j) = \frac{e^{-\beta_\xi U_j}}{\sum_{q=1}^{M} e^{-\beta_\xi U_q}}. \tag{23}$$

Here U_j — is the utility of the subject j. $\xi(j)$ — the integral rating of the subject. β_ξ — could be called the inverse social temperature.

The entropy of the subjective rating preferences is equal

$$H_\xi = -\sum_{j=1}^{M} \xi(j) \ln \xi(j). \tag{24}$$

Description (23) formally coincides with the Gibbs description in kineto-dynamics, where β is the inverse temperature.

"Social Temperature" makes a big influence upon the social system behavior mentioned above.

If T_ξ tends to infinity, then the state of psych tends to hysteria state. If, on the contrary, T_ξ tends to "0", then the state of psych tends to the "Zombie State".

In the general sense of the "<u>Social Justice Category</u>", the requirement of safety of the whole system and separate individuals should be put as the one of the main requirements.

Because the conflicts of the different kinds are the sense of social systems existence, then the main requirements of the social safety could be expressed more strictly.

Let us apply, previously introduced and used for conflict sharpness evaluation in work [11], some criteria of social justice and safety in the view of the "<u>Conflict Tension</u>" between two subjects $K_{1,2}$, which is a function of the two rating entropies: H_{ξ_1}, H_{ξ_2} and the coefficient of correlation ρ_{ξ_1,ξ_2} [4] between the rating distributions ξ_1 and ξ_2 in the group:

$$K_{1,2} = f\left(H_{\xi_1}, H_{\xi_2}, \rho_{\xi_1,\xi_2}\right). \tag{25}$$

Of course, some other criteria can be proposed. Nevertheless any of them should have a certain interpretation in subjective analysis terms.

In accordance with the statements told above some kind of conflicts could be introduced [6]. We accept that in the well organized social systems the administrative ranks are everywhere growing functions of their arguments of the social ratings. In such situations the opportunities for internal social conflicts are low. Otherwise the negative correlation between the ranks and ratings distributions could be a source of a social conflict.

There are a lot of possibilities for the measures of such ranks. For example, consider the following functional originating the recursion scheme:

$$\Phi_{\xi_{t,t+1}} = -\sum_{j=1}^{M}\xi_{j_{t+1}}\ln\xi_{j_{t+1}} \pm \beta_{\xi_t}\sum_{j=1}^{M}\xi_{j_{t+1}}u_{j_t} \pm \alpha_{\xi_t}\sum_{j=1}^{M}\xi_{j_{t+1}}\ln\xi_{j_t} + \gamma_{\xi_t}\sum_{j=1}^{M}\xi_{j_{t+1}}, \tag{26}$$

where β_{ξ_t} and α_{ξ_t} — corresponding structure parameters.

From condition

$$\frac{\partial\Phi_{\xi_{t,t+1}}}{\partial\xi_{j_{t+1}}} = 0, \left(j \in \overline{1,M}\right), \tag{27}$$

the rating distribution is being found:

$$-\ln\xi_{j_{t+1}} - 1 \pm \beta_{\xi_t}u_{j_t} \pm \alpha_{\xi_t}\ln\xi_{j_t} + \gamma_{\xi_t} = 0,$$

$$\ln\xi_{j_{t+1}} = \gamma_{\xi_t} - 1 \pm \beta_{\xi_t}u_{j_t} \pm \alpha_{\xi_t}\ln\xi_{j_t},$$

$$\ln\xi_{j_{t+1}} = \gamma_{\xi_t} - 1 \pm \beta_{\xi_t}u_{j_t} + \ln\left(\xi_{j_t}\right)^{\pm\alpha_{\xi_t}},$$

$$\xi_{j_{t+1}} = \exp\left[\gamma_{\xi_t} - 1 \pm \beta_{\xi_t}u_{j_t} + \ln\left(\xi_{j_t}\right)^{\pm\alpha_{\xi_t}}\right]$$

$$= \exp\left[\gamma_{\xi_t} - 1\right] \cdot \exp\left[\pm\beta_{\xi_t}u_{j_t} + \ln\left(\xi_{j_t}\right)^{\pm\alpha_{\xi_t}}\right],$$

$$\sum_{j=1}^{M}\xi_{j_{t+1}} = 1 = \exp\left[\gamma_{\xi_t} - 1\right] \cdot \left\{\sum_{j=1}^{M}\left[\left(\xi_{j_t}\right)^{\pm\alpha_{\xi_t}}\right] \cdot \exp\left[\pm\beta_{\xi_t}u_{j_t}\right]\right\},$$

$$\exp\left[\gamma_{\xi_t} - 1\right] = \frac{1}{\sum_{j=1}^{M}\left[\left(\xi_{j_t}\right)^{\pm\alpha_{\xi_t}}\right] \cdot \exp\left[\pm\beta_{\xi_t}u_{j_t}\right]},$$

$$\xi_{j_{t+1}} = \frac{\left[\left(\xi_{j_t}\right)^{\pm\alpha_{\xi_t}}\right] \cdot \exp\left[\pm\beta_{\xi_t}u_{j_t}\right]}{\sum_{q=1}^{M}\left[\left(\xi_{q_t}\right)^{\pm\alpha_{\xi_t}}\right] \cdot \exp\left[\pm\beta_{\xi_t}u_{q_t}\right]}. \tag{28}$$

Numerical Simulation

The recursive scheme model (26)–(28) for the simplest case is realized with a three subject set system.

The computational initial data have been accepted as follows: $\xi_{1_0} = 0.32$; $\xi_{2_0} = 0.5$; $\xi_{3_0} = 0.18$. The rest of the values are: $\alpha = \beta = 0.8$; $u_{j_t} = y\xi_{j_t}$; $y = 0.68$.

A more developed case is when $u_{1_0} = 0.6$; $u_{2_0} = 0.70698$; $u_{3_0} = 0.8$;

$$\left.\begin{aligned}
u_{1_{t+1}} &= u_{1_t} \\
u_{2_{t+1}} &= u_{2_t} \\
u_{3_{t+1}} &= u_{3_t} \\
\xi_{1_{t+1}} &= \frac{\left[(\xi_{1_t})^{\,\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{1_t}\xi_{1_t}\right]}{\sum_{q=1}^{3}\left[(\xi_{q_t})^{\,\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{q_t}\xi_{q_t}\right]} \\
\xi_{2_{t+1}} &= \frac{\left[(\xi_{2_t})^{\,\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{2_t}\xi_{2_t}\right]}{\sum_{q=1}^{3}\left[(\xi_{q_t})^{\,\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{q_t}\xi_{q_t}\right]} \\
\xi_{3_{t+1}} &= \frac{\left[(\xi_{3_t})^{\,\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{3_t}\xi_{3_t}\right]}{\sum_{q=1}^{3}\left[(\xi_{q_t})^{\,\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{q_t}\xi_{q_t}\right]}
\end{aligned}\right\}. \tag{29}$$

The results are presented in Fig. 3.
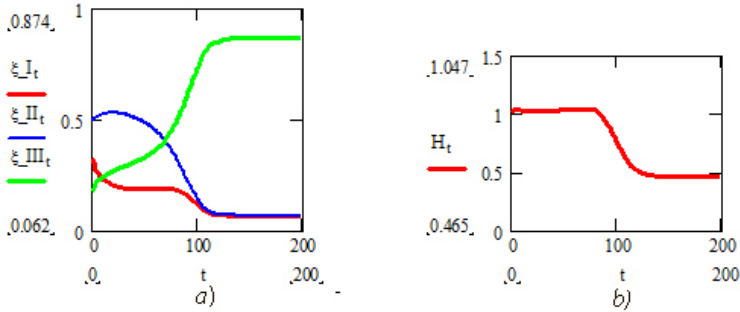

Fig. 3. — Ratings *a)* and entropy *b)*

For the social justice measures it is proposed to use the coefficients of

$$K_{1_t} = \rho_{\Sigma_t}\left(1 - \overline{H}_{j_t}\right)^{\delta}\left(1 - \overline{H}_{k_t}\right)^{\delta} \tag{30}$$

and

$$K_{2_t} = \rho_{\Sigma_t} - K_{1_t}, \tag{31}$$

where the coefficient of correlation ρ_{Σ_t} with respect to the alternative utilities is calculated by such formula

$$\rho_{\Sigma_t}(j, k) = \frac{\sum_{i=1}^{N}\left(\xi_t(j\,|u_i) - \frac{1}{N}\right)\left(\xi_t(k\,|u_i) - \frac{1}{N}\right)}{\sqrt{\sum_{i=1}^{N}\left(\xi_t(j\,|u_i) - \frac{1}{N}\right)^2 \sum_{i=1}^{N}\left(\xi_t(k\,|u_i) - \frac{1}{N}\right)^2}}, \tag{32}$$

and the relative entropies $\overline{H}_{j_t} = \dfrac{H_{j_t}}{H_{\max}}$ and $\overline{H}_{k_t} = \dfrac{H_{k_t}}{H_{\max}}$, and δ — sensitivity index.

The values of (30) — (32) are explained in a sufficient form in work [11].

The social justice modeling results, in terms of (30) — (32) for the subjects of 1 and 2 at $\delta = 0.1$, are shown in Fig. 4.
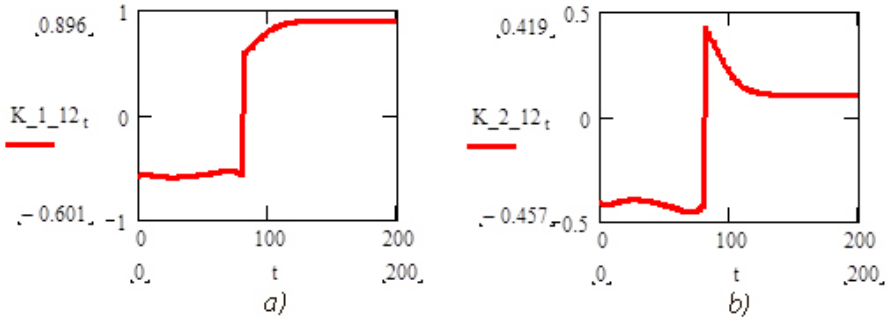

Fig. 4. — Social justice measures *a)* and *b)*

The same experiment results for the subjects of 1 and 3, as well as for 2 and 3 are illustrated in Fig. 5 correspondingly.
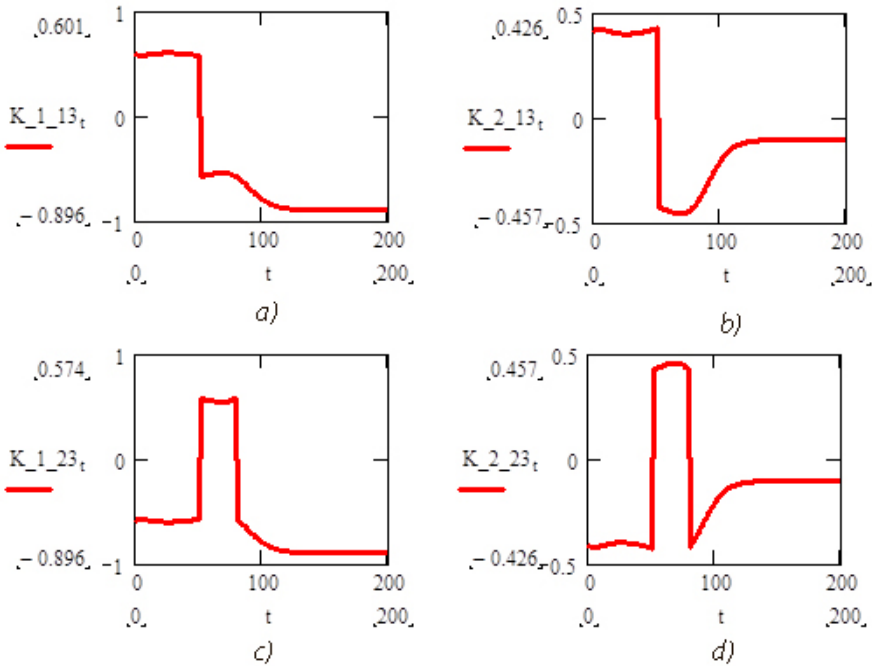

Fig. 5. — Social justice measures *a)–d)*

Next up is the case when changing parameters of the model it is possible to forecast the development of situations in the group of three subjects, for example, with three political parties.

$$
\left.
\begin{aligned}
u_{1_{t+1}} &= u_{1_t}\left[1 + \left(1 - \frac{H_t}{H_*}\right)\left(\frac{H_t}{H_{**}} - 1\right)\xi_{1_t}\right] \\
u_{2_{t+1}} &= u_{2_t}\left[1 + \left(1 - \frac{H_t}{H_*}\right)\left(\frac{H_t}{H_{**}} - 1\right)\xi_{2_t}\right] \\
u_{3_{t+1}} &= u_{3_t}\left[1 + \left(1 - \frac{H_t}{H_*}\right)\left(\frac{H_t}{H_{**}} - 1\right)\xi_{3_t}\right] \\
\xi_{1_{t+1}} &= \frac{\left[(\xi_{1_t})^{\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{1_t}\xi_{1_t}\right]}{\sum_{q=1}^{3}\left[(\xi_{q_t})^{\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{q_t}\xi_{q_t}\right]} \\
\xi_{2_{t+1}} &= \frac{\left[(\xi_{2_t})^{\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{2_t}\xi_{2_t}\right]}{\sum_{q=1}^{3}\left[(\xi_{q_t})^{\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{q_t}\xi_{q_t}\right]} \\
\xi_{3_{t+1}} &= \frac{\left[(\xi_{3_t})^{\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{3_t}\xi_{3_t}\right]}{\sum_{q=1}^{3}\left[(\xi_{q_t})^{\alpha_{\xi_t}}\right] \cdot \exp\left[\beta_{\xi_t} u_{q_t}\xi_{q_t}\right]}
\end{aligned}
\right\}, \tag{33}
$$

where H_* and H_{**} — entropy marginal values which symbolize the utilities' property to maximize at some intermediate value of the ratings entropy.

Such idea is based upon the mathematical model implying the illustrated in Fig. 6 effect with $H_* = (x = 0.9)$ and $H_{**} = (x = 0.1)$.
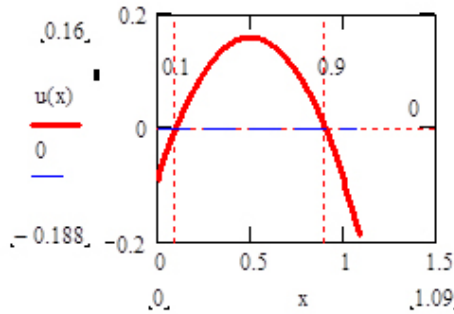

Fig. 6. — Utilities-social ratings entropy dependence concept

In the presented paper experimentations $\beta = 3$; $\alpha = 0.8$; $H_* = 0.8\ln 3$; $H_{**} = 0.2\ln 3$.

The computer simulation results for the subjects of 1–3 are shown in Fig. 7 correspondingly.

c)

d)

e)

f)

g)

h)

i)
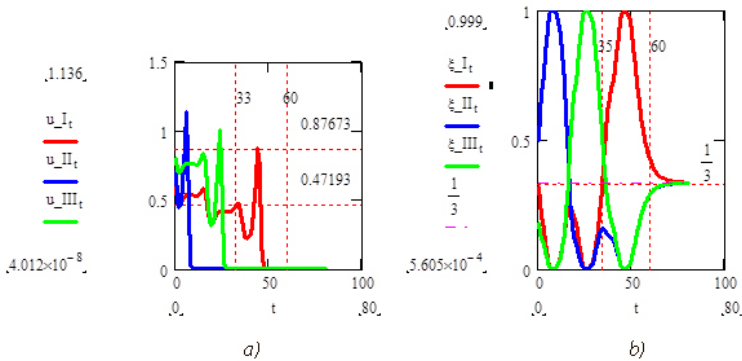
Fig. 7. — Utilities *a)*, ratings *b)*, entropy *c)*, and social justice measures *d)–i)*

Diagrams in Fig. 7 show the possible developments of social or political and economical situations with respect to the justice measures within a long enough period of time.

Analysis of Results and Discussion

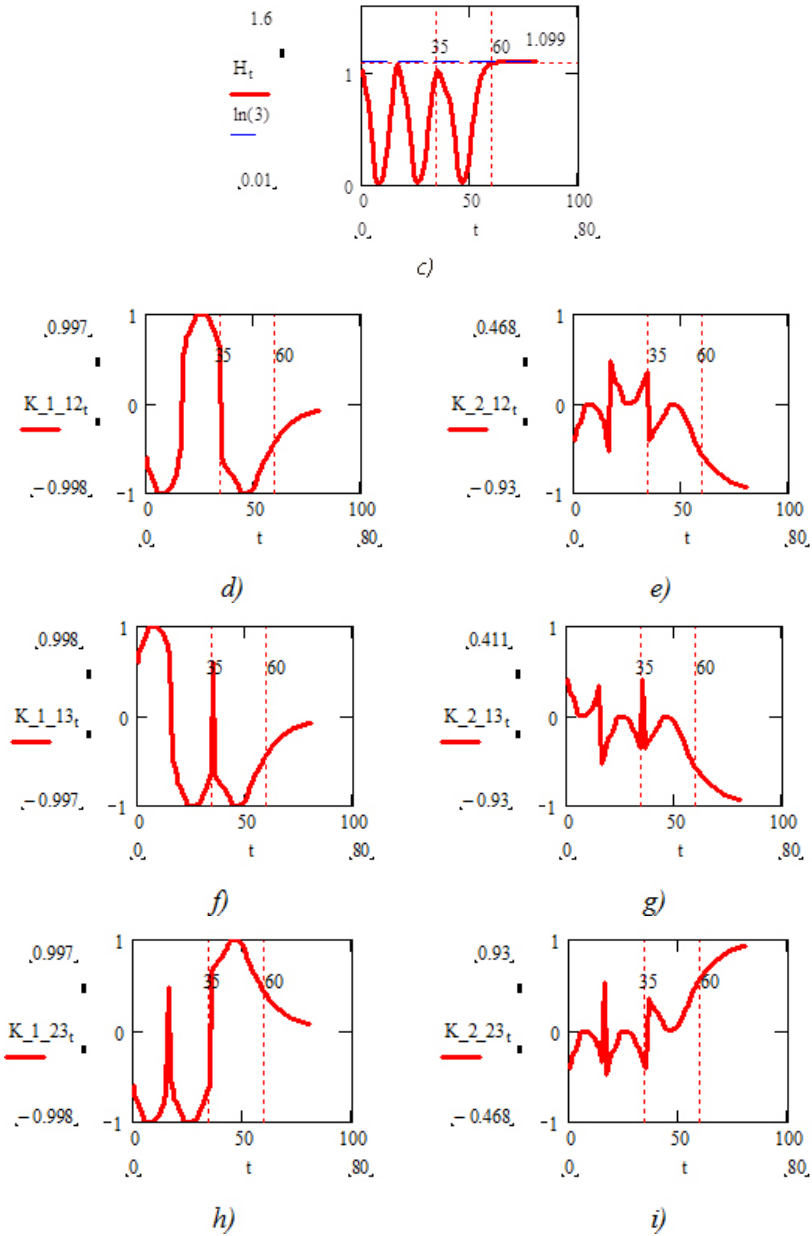As that follows from the plotted in Fig. 1–7 illustrations and diagrams, the subjective understanding of the social justice idea is grounded upon the accepted by the socium participants (individuals, human beings) imaginations about personal utilities, individuals' social ranks (ratings), with the significant impact of the ratings uncertainty measure. In the proposed herewith paper, these notions form the dynamical recursive systems, likewise (28), (29) or (33).

The ratings entropy, being a measure of the ratings uncertainty, in conjunction with the ratings themselves also influences the utilities. The recursive procedure of the mathematical model system similar to (28), (29) or (33) allows simulations of the social dynamics phenomena widely described and discussed in the trendy literature of this classification [1-6].

For instance, the effects of the egalitarian, pluralism, society might lead to the anarchy chaos visible in Fig. 7 c) entropy diagram (the ratings entropy tends to its climax value of ln3; the crucial point here is with the coordinates of $t = 60$ and $H_t = 1.0839$); when the ratings of the social groups (political parties, communities) converge (also see Fig. 7 b) curves after 60 iteration steps, let us say conditional time units, years for long term perspective prognostic simulations).

Thus, political parties' ratings become equal; the situation is of the complete uncertainty; social indifference; neglecting citizens rights or voters duties etc, resulting in tending to zero utilities (see Fig. 7 a) curves as well).

Remarkable here is the fact that the memory effect has its impact. The local extremum of the first party utility of $u_{1t} = 0.47193$ at $t = 33$ (see Fig. 7 a) red curve) results in the party's # I maximal rate (see Fig. 7 b) red curve's maximal positive differential).

Election cycles attached to the specific time intervals might be modeled in that style.

The similar features are noticeable in Fig. 3–5 too.

Conclusions

Thus, in the paper, some simple model of the social group behavior dynamics has been proposed. The main peculiarity of the model is the implementation of the new psychological principle of the maximum subjective entropy. This gives a possibility to consider the psychological problems and investigate the influence of psychology upon the social justice phenomenon. The theory has been applied to the issues of social behavior, being investigated as a dynamical process of justice. That allows receiving the numerical estimations.

It is for sure, that such approach, to the problem solution, could be useful to forecast some social events developments connected with the problem of social justice.

It is seen that further problem is the problem of identification and structure parameters of the model. To make the results more realistic. Besides, farther development of the theory may be based upon preferences of the first kind — objective preferences.

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Ukrainian ethnos as a complex socio-cultural phenomenon: formation, dynamics, prospects

Volodymyr Yevtukh[1]

Abstract. The article refers to such a phenomenon as Ukrainian ethnos. The theoretical framework for investigation is introduced. Under the consideration the following questions are: the concept of the notion, the roots and sources of its formation, dynamics in different historical times. The phenomenon is analyzed from the socio-cultural perspective. Ukrainians living in different countries are presented as a holistic unite; the reason for that are links with ethnic homeland, common cultural features, common traditions, common customs, a number of common human values. The basic approaches in analysis of Ukrainian ethnos are used: geographical/territorial distribution and the level of ethnic (Ukrainian) awareness. The role of ethnic memory, of ethnic heritage, of ethnic identity, of ethnic practices and ethnic participation for communicating and uniting the parts of Ukrainian ethnos are discussed. Prospects for common ethno-cultural activities and communication of Ukrainian diaspora with mainland Ukrainians are under the question too.

Keywords: Ukrainian ethnos, mainland Ukrainians, "Ukrainians abroad", Ukrainian diaspora, dynamics of Ukrainian ethnos, ethnonational structure, theoretical framework.

The term "ethnos" and around

The term "ethnos" has long been known to science — in the late of the XVIII-th and early of the XIX-th centuries and was used in different meanings by known social scientists: Lewis Henry Morgan, Adolf Bastian, Georges Vacher de Lapouge [15].

It is to be realized that the word as a noun — *ethnos* and its derivatives as adjectives — *ethnical*, *ethnic* (or vice versa — from an adjective to a noun) were used centuries ago. Early and late XV-th (primary meaning — "*pagan, heathen*") it came from Late Latin *ethnicus*, from Greek *ethnicos* and meant *nation*, *national*. Two aspects of this meaning are to distinguish: 1) by some writers "adopted to the genius or customs of a people, peculiar to a people"; 2) among grammarians "suited to the manners or language of foreigners". Concerning the word "*ethnos*" it is "band of people living together, nation, people, tribe, caste" [19].

In context of our investigation it is important to remember: the analysis of the state-of-the-art reproduces two tendencies as to use the word "*ethnos*" and its derivatives "*ethnical*", "*ethnic*": 1) in Western tradition we are facing

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more with "*ethnic group*" and "*ethnicity*" in a sense "*ethnos*" and "*ethno*" — word-forming element used to form modern compounds in the social sciences [20]; 2) in Ukrainian case "*ethnos*" is one of a core notion to explore issues connected with the origins of peoples or their parts and their structuralization on the basis of cultural and behavioral patterns.

For a long time, term "*ethnos*" was expelled from usage in the Soviet scientific literature, substituted by the term "*nation*" both in its usual meaning (ethnic, political state) and in the sense in which the term "*ethnos*" had originally been used. The basis for contemporary used the term "*ethnos*" was formulated by French anthropologist Joseph Deniker, including peoples, tribes and nations as the form of existence of ethnoses [11, 18]. In this sense among main markers of an ethnos a common memory, common language, common descent, common complex of customs (in more broader sense ethno-cultural practices), singularities of everyday life and vital functions, and I add *psyche*, as well as an awareness of its integrity and distinction form other similar formations are [7, 127–134].

In general understanding I define "ethnos" as a special kind of human community which was developed historically and represents specific form of collective existence of its members. Its existence does not depend upon the will of individuals. It is capable to exist for a long time due to its sustainable self-reproduction [7, 127].

In order to show various manifestations of ethnos' existence ethnologist Julian Bromley proposed one more term — "*ethnicos*" [2, 37]. This term gradually came to use, when the issue concerned a people in its proper ethnic sense. Thus, it drew a distinction between the meanings of the term "*people*", like a) the whole population of this or that country; b) working masses; c) a crowd. By the way, French philosopher Josheph Ernest Renan proposed to his time (1919) to make a difference between "*ethnos*" and "*large ethnos*" [11, 18]. We can see the similarities in understanding of the phenomenon by both scientists. My approach in interpretation of the theory of an ethnos bases upon structural/functional factors and an ethnos as a type of human community function thanks diachronic information ties which ensure the continuity of ethnic information (the idea was developed by Russian ethnologist Sergey Arutyunov — [1]). Ethnoses can exist compact or dispersed, maintaining immediate or indirect information ties within one country or several countries.

There are a number of theories of ethnos. *Theory of ethnos* means a system of conceptual approaches within which an origin, principles of existing, development and role in social life of an ethnos interpret. I have counted eleven of them. I do not analyze them in this article, it is a deal of other investigations. In my classification these are: dualistic ("*ethnos*"-"*ethnicos*"); evolutionary/historical (social community that appear as a result of historical development); constructive (ethnos is an artificial formation, the result of the purposeful activity of the people themselves); instrumentalist (ethnos is an instrument in the power struggle); passionate (a group of people who is formed on the basis of the original stereotype of behavior), primordialist (ethnos is a natural entity), socio-biological theories, theory of Arutyunov/Cheboksarov (ethnos is built on the information and communication links), theory of the single (holistic) Jewish ethnos (all Jews, wherever they belong to this ethnos), theory of Peter van den Berghe (ethnos is a kind of biological community which is formed on the basis of genetic inclinations of family selection) [26].

Author's interpretation theory is based on a combined approaches of structural/functional theory and theory of holistic Jewish ethnos. This combination is relevant to the situation with Ukrainian ethnos as it: 1) is dispersed over the World and 2) its unity is ensured by diachronic information ties which provide the continuity of ethnic information [7, 132-133].

Ukrainian ethnos: notion and formation

For today the accumulated information from different branches of socio-humanitarian knowledge allows to look at Ukrainian ethnos as a complex socio-cultural phenomenon and to generate its interdisciplinary definition. It is characterized by common ancestry, common features of culture, language, psychics, stable level of consciousness of belonging to the ethnic community. For a large number of Ukrainians the striving for building their own nation-state was one of the most powerful factors that unite them and strengthen the positions of the ethnos. Another important factor in this unifying process is the presence (either one way or another) of the above characteristics of an ethnos by different parts of Ukrainians and their descendants. These two signs make it possible to look at Ukrainians wherever they live as an integral unit.

The formation of Ukrainian ethnos is associated with ethnogenesis of Ukrainians. The most widespread theory in this case for today the early medieval theory is. It says that Ukrainians developed in accordance with universal laws of ethnic development of Medieval Europe on the base of autochthonous principles: it means that the core of Ukrainians the population lived on the territory of contemporary Ukraine of previous historical periods consists [5].

Today the Ukrainians and their descendants are living in almost hundred countries of the world. Speaking about Ukrainian ethnos one has to take into account that in territorial dimension it consists of two parts: the Ukrainians located within geographical boundaries of the state "Ukraine" and outside of its territory. Different environments have a different effect upon the state the parts of the phenomenon. That's why the geographic/territorial perspective of analysis of Ukrainian ethnos is important as much as perspective of its internal development.

To understand the transformation processes of Ukrainian ethnos one has to look at the ethnic environment in which its parts are located and with what kind of ethnicities Ukrainians or their descendants are communicated.

The-state-of-the-art

Ethnos became a subject of scientific interest of Ukrainian researchers at the end of XIX- th and the very beginning of the XX-th centuries. Naturally, that the focus of their attention Ukrainian ethnos is. Such an interest was provoked to my mind by intensification of the national movement on the territory populated by Ukrainians who sought to gain independence in one form or another. Among the domestic contributors in exploring the phenomenon "Ukrainian ethnos" there are historians, ethnographers, ethnologists, sociologists, political scientists, cultural scientists, linguists: Mykhailo Brayichevskyi (1924-2001), Yaroslav Dashkevych (1926-2010), Mykhailo Hrushevskyi (1866-1934), Yaroslav Isayevych (1936-2010),Vasyl Lisovyi (1937-2012), Oleksandr Potebnya (1835-1891), Mykhailo Vivcharyk (1941-2003), Valentyna Borysenko,

Yaroslav Hrytsak, Ivan Monolatiy, Vsevolod Naulko, Oleksandr Nelga, Mykhailo Stepyko, Volodymyr Troshshynskyi, Kostyantyn Tyshshenko, Volodymyr Yevtukh, Leonid Zaliznyak and others. The questions of historical development, of ethno-cultural context of formation of Ukrainian ethnos, of communication with other ethnicities in different parts of Ukraine, of ideological role of ethnicity in building of Ukrainian political nation became subjects to their consideration. At different times they have studied and continue to do study varied aspects of the phenomenon. Information about author' contribution to the study of Ukrainian ethnicity in general and Ukrainian ethnos in particular one can see in the special publication [6, 17-47].

The topic is attracting the attention of some foreign researchers: Ola Hnatiuk (Poland), Vsevolod Isayiv (Canada), Andreas Kappeler (Austria), Roman Shporlyk (USA), Gerhard Simon (Germany), Andrew Wilson (Great Britain). They analyzed some ethnic issues mostly in context of formation and functioning of Ukrainian nation.

Ukrainians in the ethno-national structure of the country's population

The overwhelming majority of members of Ukrainian ethnos are living on the territory of Ukraine. Ukrainians consist about 78 % of the country's population (over 32 Mio — it means around 65 % of all Ukrainians in contemporary world).

According to the last census (2001) representatives of above 130 *ethnie* (the term proposed by Jean-Loup Amselle [15]) populate the today's Ukraine. The polyethnic composition of the population of Ukraine is a phenomenon which has its roots in the past. Two ways led to the present polyethnicity [28] of the country: migration and separation of independent peoples from ancient Slavonic tribes, residing on the territory of Kiev Russ (XI-XII century).

The last we name autochthonous population — ethnic communities formed on the base of three Slavonic tribes (Ukrainians, Russians-Russkiye, Byelorussians). By the way, I propose to make a distinguish between the terms "Russian" and "Russkiye" and to apply for this kind of people on the territory of Ukraine the last term because in my opinion it corresponds to their status in Ukraine [29]. The other population is allochthonous — ethnic communities formed on the base of the people came to the territory of contemporary Ukraine or people lived on the territories included into Ukraine in different periods (Armenians, Hungarians, Jews, Moldovians, Poles, Romanians etc.) and on the base of new ethnicities — immigrants. The distribution of the ethnicities is as following: *12 (of 27) regions* — number of ethnicities from 3 to 8 (alphabetically): Chernivtsi, Crimea Dnipropetrovsk, Donetsk, Kharkiv, Kirovograd, Lugansk, Mukolayiv, Odessa, Poltava, Zakarpattya, Zaporizhzhya; *20 regions* where number of ethnicities represents over 0.1 % in the population of a region (Ukrainians and Russian-Russkiye not included) — *East* (Donetsk, Kharkiv, Lugansk), *South* (Kherson, Mykolayiiv, Odessa), *West* (Chernivtsi, Ivano-Frankivsk, Lviv, Rivne, Ternopil, Volyn, Zakarpattya), *Center* (Cherkassy, Dnipropetrovsk, Kirovograd, Poltava, Zaporizhzhya), *North* (Chernigiv, Kyiv, Sumy, Zhytomyr) — *18 ethnicites.*

There are several ethnic areas in Ukraine: *the Crimea* (Armenians, Crimean Tatars, Russian-Russkiye, Ukrainians), *Bukovyna* (Moldovians, Gagauz, Russian-Russkiye, Romanians, Ukrainians), *Odessa* region (Bulgarians, Gagauz, Moldovians, Russian-Rysskiye, Ukrainians), *Zakarpattya* (Hungarians, Romani, Russian-Russkiye, Ukrainians).

Now Ukrainian ethnos is a basic component of the building up of Ukrainian political nation in the interactions with other components of the ethnonational structure of Ukrainian society (ethnic minorities — for example Russkiye, Hungarians, Poles etc.; not numerous representatives of other ethnoses — for example, Ukraine's citizens of Eskimo origin; communities with uncertain ethnic status — Crimean Tatars, Karayit, Krymchaks). As to the distribution of Ukrainians on the territory of the country they consist the majority of the population in all the regions except the Crimea: from above 57.0 % in Lugansk to almost 98.0 % in Ternopil. In 19 regions the number of Ukrainians exceeds 80.0 %. 85.0 % of Ukrainians recognize Ukrainian language as their mother language.

The data received from the survey "Identity of Citizens of Ukraine under New Conditions: Changes, Tendencies, Regional Peculiarities" conducted 2016 make it possible to draw some conclusions concerning the state of sociocultural processes among Ukrainians living on the mainland. We look at language identity in different dimensions (mother tongue, language used in family communication and in social environment, level of native language proficiency), cultural identity (referring to a certain cultural tradition, social distance with other ethnicities). Evaluating the results of the survey one has to keep in mind that 86.0 % of respondents the Ukrainians made up.

Language identity: 60.0 % of respondents consider Ukrainian to be native (2006 — 52 %); 44 % for family communication are choosing Ukrainian language (2006 — 39 %); outside of home 40 % of respondents communicate Ukrainian (2005 — 37 %). The tendency shows a stable increase of the use of Ukrainian language in different spheres of communications. Another fact is evident: the share of those speaking and using Ukrainian is growing in the directions from the East to the West and from the South to the North [8, 8].

Cultural identity: 70 % of respondents identify themselves with Ukrainian cultural tradition (2006 — 56 %). The territorial dynamics is the following: Donbass — 38 %, the South and the East — 64 %, the Center — 81 %, the West — 85 % [8, 9]. In this context we can state that the social distance between Ukrainians and the people of other ethnicities is decreasing; the same tendency is to be seen in the case of different regions [8, 10].

The above facts lead to a conclusion about that the positions of "Ukrainisness" in Ukrainian society become more stable and the cohesion of society is happening around this values ("Ukrainisness") with the participation of ethnic minorities values. Such processes are largely a result of activities of Ukrainian ethnos, primarily of the part that is located in mainland Ukraine. The results of the survey conducted by Sociological group "Rating" (3-10 August 2018) confirm the statement that the process of cohesion of Ukrainian society is in progress: 82 % of respondents consider themselves patriots of Ukraine, about 80 % support the Independence of Ukraine (2012 — 62 %), 66 % identify themselves as citizens of Ukraine (2010 — 57 %) [4].

Speaking about dynamics of Ukrainian ethnos and especially about its cohesion one has to keep in mind that within the ethnos several sub-ethnoses and ethnographical groups exist, with their ethno-cultural specificity. These are Hutsuly, Boiky, Lemky, Podolyany, Polishchuky. They preserve and develop special features in traditions, customs, folk art and behavior which differentiate them from each other and give a certain peculiarity to the Ukrainian ethnos as a holistic entity [12].

"Ukrainians abroad" as a part of Ukrainian ethnos

Theoretical remarks.   This phenomenon is multi-layered and includes different categories: diaspora, emigrants, temporarily residents remaining in country for business opportunities, employment, education and extended stays with relatives who have emigrated. The main characteristics, which identify individuals as "Ukrainians abroad", are their ethnicity, self-identification and their contribution of support and development of Ukrainian ethnicity abroad and situationally in Ukraine. The diaspora represents the largest number of "Ukrainians abroad" and constitutes a high level of ethnic identity and is the most active in the preservation and development of Ukrainian culture outside of the country. The number of the diaspora is approximately 18-20 million (according to recent calculations). This group comprises people of Ukrainian origin who departed their Motherland during differing periods and autochthonous Ukrainian populations who resided in other countries as a result of historically reestablished borders in the East and the North of Ukraine (Belarus, Russia), as well as in the West (Poland, Romania, Slovakia, Hungary). The majority of the diaspora and the number of people of Ukrainian origin who reside outside grouped "Ukrainians abroad", constitute a representative population which possess a sufficiently high level of ethnic identity, on the one hand, and, on the other, they posses double or triple ethnic identity which is formed while interacting with people from other countries and the local population. They, as T. Holly, may have different identities: civic, ethnic, hybrid and atomized [22].

The first source of the Ukrainian diaspora formation *emigration* was that intensified during the last decades and presents the second largest component of "Ukrainians abroad". However, not all emigrants have become integrated into the diaspora nowadays; some of them aim at integrating into the mainstream (in ethnic sense too) of a society in which they live. This involves a rejection of certain markers of Ukrainian identity. A special category is presented by migrants who left the country under the pressure of instability and military actions in the Crimea and in some areas of Donbas. The most urgent problems for such forced migrations are social priorities. Therefore a maintenance of ethnic and cultural identity is relegated to the background. Persons of Ukrainian origin who temporarily reside in other countries form the third group of Ukrainians. This group is so small and is not of the greatest importance; it is more situational, as evidenced by the sporadic participation in some activities related to Ukrainian identity. This is in evidence by participation in demonstrations and fundraising events supporting Ukrainian's European aspirations and the fight against the aggression of placecountry-regionRussia. Citizens of Ukraine, who are on short-term or long-term business trips abroad rarely participate in such kind of activities.

Sources of formation: past and present. People from Ukraine and their descendants, as mentioned above, live in more than one hundred countries. According to their geographical locations, three major areas can be singled out: *Western* (countries to the west of Ukraine, including Eastern and Western Europe, North, Central and South America and the Baltic countries), *Eastern* (the countries to the East of Ukraine — Russia, countries of the former Soviet Union (Armenia, Azerbaijan, Georgia, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan), and the countries of South-East Asia) and *Southern* (countries located in Africa, Australia, New Zealand).

As forerunners of "Ukrainians abroad" (1608-1880) can be considered: the relocation of the Cossacks to Turkey and Western Europe after their defeat at the Battle of Poltava (1709), the Cossacks' resettlement to Dobrogea in The Ottoman Empire (now Romania) and to the Volga and the Urals regions in the Russian Empire after the destruction of the Zaporizhzhya Sich (1775) by Catherine II and the building of settlements in the Transcarpathian region. The intense movement of Ukrainian people and the formation of Ukrainian ethnic settlements in many countries occurred during four waves: 1) the last quarter of the 19th century — to the beginning of the First World War; 2) the period between the two World Wars; 3) the period after the Second World War; 4) the years of an independent Ukraine. For each of these waves there were characteristic features related to their quantitative, demographic, social, ethnic structure and ethnic environment in the country of residence. For example, the most numerous emigration from Ukraine took place before and during the first wave, almost a million people moved to the North and South American continents and more than 3.5 million were highly assimilated — in different parts of the Soviet Union; the least numerous emigration from Ukraine has been during the fourth wave (several hundred thousand people).

Socio-cultural measurements. The circumstances of the formation of "Ukrainians abroad" as a social phenomenon and its viability in differing ethnic environments, in particular the integration of its representatives in the social and ethno-cultural area of the settlement, were conditioned by several factors. These are: 1) the quantitative composition of emigrants from Ukraine; 2) the geography of origin; 3) the settlement structure in the countries of residence; 4) the policy of the governments and local authorities to emigration; and 5) the level of tolerance/intolerance in interethnic relations at national, regional and especially at local levels. For the designation of a social phenomenon particular components are necessary. That is, the number of people of Ukrainian origin who are able to present themselves in social and ethno-cultural terms as a structured community of country (by Raymond Breton, constitute a community of "institutional completeness") [16]).

Favorable conditions for the functioning of the phenomenon "Ukrainians abroad" in the context of its quantitative measurement are mostly available on the territories where ethnic areas and ethnic enclaves of Ukrainians were formed, particularly in the USA (the metropolitan area of Detroit, New York, Chicago), Canada (Alberta, Manitoba, Saskatchewan), Australia (Melbourne, Sydney), Kazakhstan (northern parts of the country, Almaty), Russia (Altai, the Far East, Western and Eastern Siberia, Krasnodar Krai, Magadan

oblast, Moscow, Volga, St. Petersburg, Stavropol Territory, Yakutiya), Poland (border with Ukraine), Romania (Bucharest, border lands) and Slovakia (Slovak-Ukrainian border zone). However, in today's conditions, the worsening of relations between Russia and Ukraine is narrowing the field of their socio-cultural activities.

The geographical location of Ukrainian ethnic representatives plays an important role in the identification of their cultural and customary traditions and, in general, concerning the level of unity of "Ukrainians abroad", as well as interpretation of the phenomenon as a structured holistic phenomenon. It is known that traditionally, especially during the first and second waves of emigration, emigrants from Western Ukraine moved westwards, and those from central and eastern regions of Ukraine predominantly migrated to the East. This tendency influenced the character of life in different ethnic environments. Cultural traditions and customs of the Western-oriented people from Ukraine have been marked by purely Ukrainian ethnicity (to some extent sub-ethnic splashes of Boyky, Hutsuly, Lemky) and at the same time by ethnicities of people from other countries with whom they interacted, within different ethnic and political states — Poland, Romania, Slovakia and Hungary. The majority of Ukrainian ethnophors who migrated to the East, were under the influence of Russian ethnic factors (as a part of the Russian Empire) and accordingly, were deeply marked by the Soviet mentality. During the time of an independent Ukraine the number of Ukrainian ethnophors in the eastern areas does not increase, as the main destinations of the fourth wave North America and Europe are.

Taking into consideration the circumstances listed above, the notions of the "Western diaspora" and the "Eastern diaspora" have not only geographical importance, but also reflect the reality of a socio-cultural distinction of the two branches of the diaspora with their laws and patterns of development. A portion of the Ukrainians geographically belonging to the "Eastern diaspora", stand out in a social sense. It is about those Ukrainians who live in Asian countries and their social and cultural development is influenced by the circumstances of development in those countries. Therefore, the socialization of the representatives of the two branches takes place with certain differences, especially with regard to the possibility of social mobility and the preservation of ethnic and cultural identity. These processes are more intense in states, whose politics is based on the principles of democracy. The ethno-political behavior of emigrants from Ukraine and their descendants during the crisis in Russian-Ukrainian relations (from 2014) has become undeniable proof of this statement: citizens and non-citizens of Ukrainian origin in various Western countries actively opposed Russian aggression towards Ukraine, while the Ukrainian ethnophors in Russia were almost inactive. Moreover, the countries with higher levels of democracy, particularly European countries where Ukrainians live, possess a significantly higher level of tolerance for those of other countries: these are Austria, Belgium, UK, Spain, Italy, Germany [9]. Despite the restrictive measures (such as immigration quotas), and taking into account the significant contribution of people of Ukrainian origin in the social and cultural development of the United States and Canada and their deep root in the social life of these countries, they have the same opportunities for social mobility as local citizens and citizens of other nationalities.

Social and cultural activities are realized by emigrants from Ukraine through purely ethnic societies and through their participation in the activities of the locals. First and foremost, in the USA and Canada, it was typical for emigrants to create their own social and cultural communities. These communities eased adaptation to new living conditions and integration into a new society. The most successful here relief companies, banks and ethno-cultural organizations were. The first two types of organizations provided material and financial assistance to people from Ukraine, and the others were responsible for preserving elements of Ukrainian culture, traditions and customs and fostering links with the ethnic homeland.

Due to the efforts of cultural institutions there are "islands" of Ukrainian identity preserved in the United States, Canada, Brazil and Argentina and anywhere. In the United States to these institutions one may refer to the Ukrainian Free Academy of Sciences with its branches establishments in the USA and Canada; The Art Museum of Ukraine in Detroit, New York and Chicago; the open air museum "Ukrainian Village Cultural Heritage" (Alberta, Canada); The Shevchenko Scientific Society, The Center for Demographic and Socioeconomic Research of Ukrainian Studies in the United States; The Museum of Ukrainian Culture in Svydnik (Slovakia), Ukrainian State School in Riga (Latvia) etc. During the celebration of certain historical dates and events in the history of the Ukrainian people or settlements, cultural festivals of their ethnic community or the presentation of Ukrainian art at other ethnic festivals are significant markers of Ukrainian ethnicity. A powerful factor uniting "Ukrainians abroad" and creating their image as a part of broader historical and social phenomenon "Ukrainian ethnos" is the initiation of several large and powerful projects and activities of Ukrainian umbrella organizations. These include the Ukrainian World Coordinating Council, consisting of noncommercial organizations from Ukraine and beyond its borders, with the aim to uphold and protect linguistic, educational, social and cultural interests of Ukrainians worldwide; The Ukrainian World Congress (UWC) uniting Ukrainian central boundary representations of 28 countries in North and South America, Europe, the former Soviet Union and Australia, and The European Congress of Ukrainians (EKU), which focuses on issues of Ukrainians living in European countries. To this list one can add The World Federation of Ukrainian Medical Associations, and The Association of Ukrainian Culture.

Dynamics of Ukrainian ethnos

The structure of the Ukrainian ethnos is more complicated (but also more adequate), when the factor of self-consciousness (self-awareness) and at last self-identification of the representatives of its core and diaspora components are put into the base. In this connection I shall use the conceptualization, proposed by the outstanding English ethnologist Anthony Smith, and according to which the structure of every ethnos can be imagined in the form of three circles: 1) core; 2) marginal stratum; 3) ethnic categories [25].

The representatives of the core of the Ukrainian ethnos are characterized by the highest level of self-consciousness and self-identification with the Ukrainian ethnos. This core, undoubtedly, is on the territory of Ukraine. However,

we have to take into account that the limits of the core of the Ukrainian ethnos, determined according to the factor of the ethnic self-consciousness, are not those limits, determined by the factor of location. In order to demarcate the contents of the term "core of the Ukrainian ethnos" in the context of two factors' action — self-consciousness and location, we shall use the term "settler's core" for the last (the sociological term "settler's structure" can serve the analogy). In the first case they are considerably narrower than in the second one. Not every Ukrainian of Ukraine can be included in the group with a high level of the Ukrainian ethnic self-consciousness, that is, not everyone is such a person, who not only demonstrates his Ukrainian origin or belonging to the Ukrainian ethnos, but also promotes the reproduction of the Ukrainian ethnos. Moreover, a considerable part of the settler's core of the Ukrainian ethnos is in another (marginal) stratum or even among the ethnic categories. We can determine how the representatives of the settler's core are distributed (in percentage) among three structural levels — core, marginal stratum, ethnic categories — after ethno-sociological research, in particular by the survey.

In my opinion, one may be included in the marginal stratum, those who are characteristic of "double, triple self-consciousness".

Such self-consciousness has been formed as a result of the fact that representatives of the Ukrainian ethnos were under the influence of other ethnic groups, either living together with representatives of other *ethnoi*, or under the conditions of another ethnic environment. As a result of intensive interaction between them, a process of transferring a person to the marginal stratum takes place, since a person continuously is between two or several *ethnoi*, culture and mentality correspond. The marginal person is characteristic of the ethnic elements of those people with whom he interacts. The marginal condition is a stage toward assimilation, primarily an objective process in the interaction of two or several *ethnoi*. But taking into account the fact that in the majority of cases the ethnic policy of the states, on the territories of which various parts of ethnos are situated, was directed, if not to absorption, then at least to limitation of another ethnic factor's role in the social life of its ethno-political organism; assimilation assumes the attributes of a purposeful and coercive process. Coercive does not necessarily mean one connected with use of force. Most likely, it is shaped in conditions under which the individual practically has no alternative and assimilation to another ethnic environment seems only a natural striving to become a part of the higher culture. The latter is to a considerable extent characteristic for the ethnic interaction in the former Soviet Union. It also pertains to the Native Americans of the USA and Canada, where a so called American way of life was imposed on them and the internal relations and life system of this ethnic minority were broken.

Thus, there is an every reason to include in the marginal stratum of the Ukrainian ethnos a certain part of the settler's core, representatives of other *ethnoi*, living in Ukraine (to the latter belong, first of all, those settled in the Ukrainian-ethnic environment and not having intensive contacts with the representatives of their own ethnos) and practically the whole Ukrainian diaspora with individual exceptions. I define such cases when citizens of other countries, Ukrainians by birth, preserve Ukrainian ethnic features under the conditions of another ethnic environment and their activity stimulates the development of

the Ukrainian ethnos in Ukraine. There are many such "individual cases" after proclaiming the independence and giving the possibility of foreign citizens, Ukrainians by birth, to take part in the construction of the Ukrainian state.

I propose that we include those individuals, who have practically lost their Ukrainian ethnicity and their connection with the Ukrainian ethnos into the *ethnic category*. Not having exact data about the number of those who can be included to the ethnic category, we have every reason to affirm that the predominant majority of them are representatives of the Ukrainian diaspora. This is because they did not have the opportunity to support and develop their Ukrainian features (in the states of the former Soviet Union), or that for the second, third and succeeding generations their Ukrainian origin, if not impeded, then in any case did not promote their social mobility in the countries of the Western World. I shall remark in this context that the population of Ukraine has to a considerable extent a mythological idea about the possibilities of development of the Ukrainian ethnos and about its condition proper in the countries of Europe and America. These possibilities are limited, despite the high level of democracy in these countries (first of all the issue is one of the level of the state regulation of interethnic relations), by virtue of various reasons of an objective and subjective character. To preserve and to develop own ethnicity is to a large extent a matter of individuals — it depends much on their wish to do or not to do this.

Having fixed three constituent parts of ethnos (in self-awareness context), I do not connect them with any constant number of representatives of the Ukrainian ethnos, since transition from one structural element to another can take place under various conditions. This movement can be in such directions: 1) for the core: core — marginal stratum — ethnic category; 2) for the ethnic category: ethnic category -marginal stratum — core; 3) for the marginal stratum: marginal stratum — core; marginal stratum — ethnic category.

It is worthwhile to pause briefly to consider the character of this movement, determined by changes in the level of self-consciousness and ethnic self-identification. If, for example, to take the movement from core to ethnic category, such a process is not straightforward and is not always completed with transition to the core of the ethnos. It seems to me (in any case this assertion is caused by observations, partly fixed in ethnological literature), that in recent years movement in the direction of the Ukrainian ethnos' core became more intensive, than movement to the ethnic category. The first condition of it is a possibility to construct an independent Ukrainian state, where Ukrainians form the ethnic base, which is an obligatory element of existence of any ethnopolitical organism and in which the conditions of revival and development of the Ukrainian ethnos are created. Broadening the diapason of the Ukrainian language's function, increasing the number of Ukrainian cultural-informative institutions, stepping up the interaction of the representatives of diaspora with the core, consolidation of Ukrainians as a subject of the world intellectual space — are appreciable phenomena, which corroborate with the notion of the intensity of the movement to the ethnos' core. Prognoses of the movement's future are connected first of all with our possibilities to develop the bases (economic, political, spiritual) of the independence of Ukraine. I shall note that it is important here that the strengthening of independence not be perceived as

a road to Ukraine's isolation, but as a road to Ukraine's rightful place in the world community and its interaction on the basis of equal partnership with the surrounding world.

Moreover, one should not place too much emphasis on the influence of the processes of building an independent Ukrainian state upon the intensification of movement to the core; the dialectic of the social development means that the fate of the Ukrainian state depends to a large extent on changes within the mainland part of Ukrainian ethnos. I mean first of all how consciously the population of Ukraine and Ukrainians first and foremost will strengthen the core of the ethnos, the ethnic basis of the state. In addition I remark that strengthening this base in a polyethnic Ukrainian society must not exclude its interaction with other ethnic structures or the entry of representatives of other *ethnoi* into the Ukrainian one.

In this context there is a logical question concerning the influence of the interaction of Ukrainians with representatives of other *ethnoi* upon the changes, which can take place in all three structural elements of the Ukrainian ethnos, in particular those affecting numerous ethnic minorities.

At first glance, the appearance and development of an independent state is a powerful incentive, impelling integration into the surrounding dominant ethnic community. To illustrate the appropriateness of this we may recall migrations to America in the nineteenth and early twentieth centuries: newcomers tried at any price to join the mainstream of social life, the context of which was mainly determined by Americans of Anglo-Saxon origin. Scholarly research of these migrations and the adaptation of the immigrants to new conditions of life testify to the striving of the representatives of the first generation of migrants to create the most auspicious conditions of integration and social mobility for the second generation. The second generation understood the advantages of "Americanization" and refused everything that would prevent it from utilizing those social and political advantages, and especially from ethnic particularity. Only when the same American society was democratized, including what concerns representatives of other *ethnoi* and their descendants, succeeding generations, changed their positions, began to appeal to their ethnic roots, and this caused a revival of the ethnic minorities. The well-known American scholar of immigrants Markus Hansen called this phenomenon "the problem of the second generation" "the principle of the third generation interest" [21, 6, 9]. We can call it in broader sense "the syndrome of the third generation" and construct the following scheme: the first generation kept its originality, the second tried to rid itself of what had been brought by their fathers, and the third generation strived for the revival of that, with which its grandfathers had come to America.

Although, in Ukraine this syndrome differs, and not only because not all ethnic minorities were formed here thanks to migration movements. Also because the lives of both Ukrainians and representatives of other ethnoses were Russified to a large extent (among non-Ukrainians even more than among Ukrainians). Today the possibilities for ethnic revival of representatives of many peoples appear in our independent state. It, undoubtedly, will influence the accentuation of the ethno-cultural distinctions among them and the Ukrainian ethnos. I do not mean here a conscious opposition of distinctions, but natural self-manifestation through ethnic heterogeneity. Simultaneous to this

process a question arises about the character of interaction with the core of the ethnos, which gives its name to the state.

On this stage we can foresee that the existence of the Ukrainian state will promote the intensive liberation (if not all, then at least a considerable part) of representatives of ethnic minorities from the results of Russification (I name such a process "de-Russification") and their logical close interaction with the Ukrainian ethnos. As a result of this, the process of transmitting the population, non-Ukrainian by birth, to the marginal stratum, and sometimes to the core of the Ukrainian ethnos, can be intensified. Without losing its identity to integrate in the mainstream of social developments of Ukraine and in particular closer contacts with the core of Ukrainian ethnos is the way to cohesion of polyethnic society.

"Meeting points": interactions of two parts of Ukrainian ethnos

There are two forms of meeting of two parts of Ukrainian ethnos (Ukrainians living in Ukraine and "Ukrainians abroad"): physical and spiritual (mostly virtual communication). First one is realizing during direct contacts: World Congresses of Ukrainians which take place in Ukraine; conferences, "round tables", discussions, touristic events in different countries of location of Ukrainians and their descendants. In this case the exchange of ethnic information concerning the participation of both parts in developments of Ukraine occurs not on a stable basis, situational and last not a long time.

The second forms secure more broader spectrum for communication and is a stable channel of a circulation of information needed for maintenance of the positions of Ukrainian ethnos and support its integrity. In this sense the next three phenomena are real links between two parts: *ethnic memory* (helps to keep in mind the ancestry and historical events inherent for the parts), *ethnic awareness* (awareness of own ethnic origin and belonging to Ukrainian ethnos), *ethnic identity* (identification yourself with Ukrainian ethnos). All three phenomena strengthen *ethnic heritage*, *ethnic practices* and *ethnic participation* [17; 18; 23] — very important for existing of Ukrainian ethnos as a whole phenomenon in the world. From on the other hand heritage, practices, participation are a proper milieu to stimulate development of ethnic memory, ethnic awareness, ethnic identity. Fruitful interplay of both group of mentioned phenomena occur during carrying out such events as ethnic festivals or like this in the places of locations of Ukrainians and their descendants. Their efficiency is noticeably higher during joint actions. Exchanges of subjects of art and traditional and customary culture that carry ethnic information between two parts of Ukrainian ethnos are of a great value too. A powerful factor uniting "Ukrainians abroad" and creating their image as a part of broader historical and social phenomenon "Ukrainian ethnos" is the initiation of several large and powerful projects and activities of Ukrainian umbrella organizations. These are in particular reflected in projects of continental and diaspora scholars and public figures that presented the "Encyclopedia of Ukrainian Diaspora" in seven volumes; and the educational project of Peter Yushchenko — Portrait Gallery of several thousand units "Ukrainians in the World". The real field of intensive

exchanges of information between two parts of Ukrainian ethnos the virtual space and research centers are [3; 10; 13; 14; 17].

The mentioned in previous section Ukrainian organizations make significant contribution to development connections with Ukraine on national, regional and local levels and to promotion of the strengthening of Ukrainian ethnicity in the contemporary world. Here we add the activities of the Ukrainian World Congresses supporting "Maidan", the coordination of protests in defense of Ukraine against Russia's aggression and holding cultural and art festivals, competitions, exhibitions of Ukrainian subjects in different countries with the participation of Ukraine representatives.

Prospects (in stead of conclusion)

The fate of ethnoses depends of many factors. There are concepts according to which ethnoses are born to pass a certain life cycle and may disappear under the pressure of various circumstances, among them and interaction with the stronger partner. This applies especially to that part of ethnoses locating outside of the country of origin in foreign (in ethnically sense) environment — the members of ethnic communities are losing language, their ties are weakening, they are gradually assimilated to the environment. Concerning the non-homeland part of the Ukrainian ethnos the current situation is a bit different. Independence of Ukraine (from 1991), existing of nation-state where Ukrainians are its structuring component, emigration of Ukrainians to different countries where Ukrainians live, intensive exchanges in various spheres between the parts, and very important, inclusion "Ukrainians abroad" in the sphere of state ethno-politics inspire hope that the Ukrainians within Ukraine and outside Ukraine will remain a holistic although complex socio-cultural phenomenon for a long time.

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Academic Mobility and Academic Migration Issues: the Case of Ukrainian Higher Education

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Abstract. The article demonstrates the globalization and regional dimension of the problems of academic mobility as well as academic migration at the Ukrainian education environment. The authors' approach is based on the fact that the dialectics of globalization and regionalization has a significant influence on the essence of the processes of academic mobility and academic migration. The theoretical study and analysis of educational policy have demonstrated the need for harmonization of these processes taking into account current geopolitical challenges. The authors have explored the "order of the day" of problems related to academic mobility and academic migration, taking into account current geopolitical challenges, trying to identify the perspective directions of study of this problem.

Keywords: migration, academic migration, academic mobility, students' adaptation, brain drain, globalization, European Higher Education Area.

Introduction

The intensive development of mobility opportunities all around the world the expansion of not only economic, scientific, but educational contacts between countries, communication changes in the informational milieu also put the issue of adaptation of academic migrants in the conditions of residence in selected countries for education. Internationalization of higher education significantly increases the number of people who want to study abroad in more developed countries.

The presence of students from other countries at universities shows the inclusion of Ukraine into the international global educational system. Participation in the world educational process is one of the conditions for the successful development of a higher educational institution. Therefore, the education of abroad students occupies a significant place among the various activities of Ukrainian universities. This activity fits the logic of globalization and conceptualized in the educational practice by the concepts of "academic mobility" as well as "academic migration". These phenomena fit into the logic of developing the European Higher Education Area (EHEA) and the European Research Area (ERA), while the processes of academic mobility and migration are key tools for their implementation. These tendencies are appropriately enshrined in the European Union educational program documents.

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At the same time, in parallel with the tendencies of globalization, complex processes of academic migration, caused by the geopolitical situation in the country, take place in Ukraine. In recent years, the socio-cultural space of Ukraine is under the influence of complex contradictions of a geopolitical nature, initiated by an armed military conflict in the East of Ukraine and the annexation of Crimea. These contradictions logically initiated the processes of moving (evacuating) institutions of higher education and scientific institutions into a controlled territory in order to preserve the intellectual, economic and human potential of the regions that emerged as the arena for the implementation of the strategies of the hybrid war. About thirty institutions of higher education and scientific institutions made a forced move from the zone of military conflict following the desire to stay a part of the Ukrainian scientific and educational space.

At the same time, material facilities (campus with educational buildings, scientific laboratories, etc.), as well as the presence of a part of teaching, training, support and student staff, allowed to create institutions of higher education and scientific institutions in uncontrolled territories. Based on such facilities, the own scientific and educational space is built up at the non-controlled territories from 2014. Thus, the institutions were not moved in their integrity but separated, creating "separated" institutions and the Ukrainian educational and scientific space itself lost its integrity.

The authors of the article aim to explore the complex dialectic of globalization and regionalization trends at the processes of academic mobility and academic migration. The authors proceed from the understanding that this article is merely an "order of the day" of academic mobility and academic migration at the Ukrainian higher education system. The problem further analysis requires a series of studies using statistical methods, conducting in-depth interviews and focus groups.

Mobility Turn as Cultural Background of Academic Mobility and Academic Migration Processes

As already mentioned above, the article analyzes the problems of academic mobility and academic migration in Ukrainian higher education. Addressing this problem is caused by the need to determine the place of global and regional trends in these processes in order to make their implementation more controlled. Indeed, the being of modern society and education is increasingly beginning to be mobile. At a contemporary social and humanities studies, broad discussion concerning the mobility trends takes place over the past decade. In order to demonstrate the scale of the spread of the ideology of mobility in society using "language of numbers", we turn to the indicators proposed by Ossi Naukkarinen, the Finnish researcher on the mobility problems: "In 1950 there were 53 million cars in the world; now there are more than 500 million, and according to some estimates, over 700 million. And people do use them. In Finland, which is fairly typical in this respect, the average of the private car is driven more than 10 000 kilometres per year, which is over ten times more than in 1950. The growth of air traffic is even more astonishing. In 1950, 28 billion passenger kilometres were flown by the world's aeroplanes. Today, the figure

is almost 3000 billion — over a hundred times more. International business has also grown, which means greater numbers of objects are transported from one place to another and more currency transactions conducted" [16].

The key idea of this discussion is the awareness and further conceptual development of the concept of "mobility turn" resulting in a transformation of ideas about space and time at a contemporary society, which undergoes the radical changes to the established principles of social interaction. Indeed, mobility is a sign of the overwhelming majority of modern social phenomena: from economics and communication systems to approaches in modern education. Thomas Faist conceptualizes the essence of mobility turn in the following way: "A new paradigmatic turn has reached migration studies, the mobility turn. Following on from many turns in the recent past, such as the linguistic turn, the cultural turn and the spatial turn, the mobility turn seems to be the newest effort in diagnostic descriptions of modern society. Like other turns, the mobility turn generalizes one aspect of contemporary society to the detriment of other features. While such a turn may usefully highlight various forms of spatial mobility, it cannot be fruitfully employed unless the scholars working with this paradigm critically reflect underlying political assumptions about the nexus between spatial and social mobility. Moreover, any analysis of spatial and social mobilities needs to go beyond descriptions and start accounting for the mechanisms underlying the production of social inequalities" [8, p. 1637].

Indeed, the issue of mobility does not simply become a key methodological tool but also enters its ontological essence in the "heart" of the modern world — the phenomenon of the movement of elements of the social world is at the "heart" of modern social transformations. Consequently, the scientists were aware of the importance of displacements in modern society and throughout the history of mankind, but now it is comprehended as one of the foundations of modern everyday being, basic value, policy instrument, etc.: "Contemporary society lives at "the coordinates" of mobility and modern individual needs to transform one's own everyday practices to stay at the advance-guard of the social development, to perform successful carrier steps etc. The reports of some international organizations are demonstrated, that at the 21-th century life success depends form the people's ability to build the life strategies (as well as educational ones) taking into account the mobility tendencies at the modern society" [24, p. 103].

Thus, as a response to the adoption of a mobility turn in all the spheres of social life, the processes of academic mobility and academic migration are gaining considerable significance in the higher education system. At the same time, the authors would like to emphasize that the phenomenon of "academic mobility" as well as "academic migration" have arisen at the tradition of higher education since the founding of the first universities in the Middle Ages. The current quantitative and qualitative surge of mobility trends has led to their unprecedented updating in the global higher education area.

Global and Regional Dimension of Academic Mobility and Academic Migration Processes

In the introduction, we emphasized that any complex social phenomena are implemented in accordance with the complex logic of globalization and regionalization. Academic mobility and academic migration are no exception. Let's consider how the processes of globalization of higher education intensify the mobility trends at Ukrainian higher education. Indeed, globalization contributes to increasing the intensity of migration, the erosion of borders between states, which leads to the formation of supranational social structures, so-called multicultural societies as well as multicultural educational environments in higher education. At the same time, mobility is also a tool for ensuring the negative phenomenon of "brain drain", which should also be considered in the study of positive prospects for academic mobility and academic migration: "Global talent mobility, accompanied by such concepts as 'brain drain', 'brain gain', 'brain exchange' and 'brain circulation', has drawn attention from both researchers and policy-makers. Research into, and policies concerned with, the movements of high skills, including university academics, are largely from economic perspectives on globalization. Inquiries are framed by concerns for national economic growth; the notion that, 'human capital translates into economic capital that translates into national economic growth and competitiveness'... Brain drain assumes that people who leave one country for another will never return, and that their movement is nonreversible. These unilateral flows, described as a loss of talent, are often viewed as having negative effects on the source countries which have made an educational investment in scholars who ultimately leave their home countries" [4, p. 25].

Under the influence of globalization, Ukrainian universities seek to attract a large number of foreign students in a fierce competition while addressing the issue of achieving a high level of intercultural understanding, striving to increase the intensity of interaction between representatives of different cultures, contributing to raising the level of education of foreign students (citizens of developing countries). At the context of global society transformation, higher education policy tries to take into account the needs of different groups that provide the development of a higher school, state structures, consumers of educational services, etc., which requires the formation of new (internationally) benchmarks and standards in the field of education which would be based on the qualitative theoretical foundation: "The blurring of distinction, the breadth of opportunities for individualization and realization of freedoms, initiates the problem of distorting the deep essence of some sociocultural phenomena. The Ukrainian sphere of higher education in this context is demonstrative: Ukraine has been a participant of the Bologna process for more than ten years; however, the nature of the implementation of its ideas acquires a wide range of signs — from imitative to pathological" [13, p. 363-364].

Since both authors work at the National Pedagogical Dragomanov University, the empirical base that guided the direction of theoretical research was the processes of academic mobility and internationalization that took place in the educational environment of this university at 2017. The geography of the countries of the foreign students at the National Pedagogical Dragomanov University is represented by countries such as China, Turkmenistan, Azerbaijan,

Belarus, Georgia, Italy, Moldova, Poland, Russia, Turkey, India, Uzbekistan, Syria, Israel, Iran, Portugal, etc. In total, the university has 388 international students, including 251 students, 100 postgraduate students, and 37 students in the preparatory department.

As we demonstrated, the educational environment of the university has a pronounced multicultural nature and its productive functioning is a separate research problem. In addition, academic mobility is realized not only by students, but also by lecturers and researchers, creating a separate problem and research field: "More and more, academics are mobile, and becoming transnational, opting for international academic career development... The socio-professional networks of transnational academics and their embodied spatial knowledge are not yet seriously analyzed empirically. Is this a new academic profession? An academic profession in which all members are multilingual, regardless of discipline, gender, age, region of origin and so on? Transnational identities are being formed. At the moment we cannot even describe them systematically — even though we are beginning to understand the discourses of neoliberalism and regional homogenization which are invoked to increase their existence" [11, p. 403].

As we see, Ukraine is trying to fit its status of responsible "player" of the global educational area implementing the key provisions of the Bologna Declaration and other documents aimed at implementing globalization trends in higher education. At the same time, the problematic current socio-cultural (geopolitical) situation distinguishes Ukraine from other countries that carry out transit and active modernization of higher education in accordance with high European standards. These are complex processes of a geopolitical nature that create instability in terms of the territorial integrity of Ukraine (annexation of Crimea and military conflict in the East of Ukraine) which actualizes a specific, regional dimension of the processes of academic migration. As a result of the geopolitical conflict, many universities with part of the state and students carried out an act of forced migration similar to forced migration from zones of military conflicts: "This conflict caused large-scale migration processes. The millions of Ukrainian people become the subjects of migration trying to escape from the direct military activity at their cities. The Ukrainian politicians also understood the need of saving the social and intellectual capital of the regions. At the result, most of the scientific and education institutions performed the migration procedure too. However, this migration had a special nature: the institutions migrated without facilities and resources; the stuff of migrated institutions was not full too" [23, p. 129].

The Problem of Adaptation at Other Social, Cultural and Educational Environment

At the previous sections of the article, we demonstrated the peculiarities of the implementation of the ideology of academic mobility and academic migration at the global and regional levels. At the same time, we did not study the problems, which had arisen in Ukrainian higher education area in connection with these tendencies. Based on the logic of the study's deployment, the problem of adaptation of both foreign students and internally displaced persons (students, workers of the displaced institutions of higher education) should be reviewed.

Taking into account the desire of the displaced universities to become a new clusters of Ukrainian higher education system ("from scratch"), they begin to develop a strategy for development in the Ukrainian space of higher education taking into account the following fact: "The tragic bloody experience of territorial disintegration could be interpreted as a painful evolutionary step. At the result of external influence, the group of students, teachers and administrators can become a social capital for new educational institutions starting one's activity "tabula rasa". These people are firm to the values of university, firm to the European values such as freedom and democracy. They are firm to own Motherland. Thus, they may become a fundamental spiritual and intellectual resource for these institutions" [23, p.134]. In our opinion, it is sensible to remember the history of University of Cambridge appearing almost eight centuries ago. It appeared as a response to the socio-cultural challenges of the 13th centuries as a desire to avoid non-constructive educational practices and socio-cultural challenges of that time and place (Oxford) becoming a hub for innovation and democratic transformation.

Having carried out a revision of the globalization and regional challenges of the Ukrainian higher education system, we will consider the real problem of harmonizing the communicative space of Ukrainian higher education where complex modernization processes are taking place in response to the demands of worldwide and regional tendencies. At the same time, we would like to emphasize that regional migration processes have more or less dominant role for the development of strategies for the development of higher education in Ukraine: "The academic mobility is a demonstration of a wide range of human freedoms — the freedom to choose a place of study, the right to free movement, the academic freedom, etc. Such an understanding of this phenomenon harmoniously fits into the context of students treatment as creative individuals, who aspire to develop and actualize their potential in getting a higher education, being declared as one of the fundamental principles of the modernization of higher education in Ukraine" [13, p. 317].

In the article, the authors tried to emphasize the fact that Ukraine is a special socio-cultural landscape for the implementation of the principles of academic mobility and academic migration. At the same time, analysis of the educational policy of recent years makes it possible to distinguish between the specific tendency that looks like a simulation of the modernization of higher education in Ukraine. Ukraine signed the Bologna Declaration in 2005, however, the Model Provision on Academic Mobility was developed by the Ministry of Education and Science of Ukraine only in 2014.

This fact indicates, on the one hand, the lack of real mechanisms for ensuring academic mobility, and, on the other hand, the lack of normative documents to address complex processes of adaptation of foreign students and internally displaced persons. At the same time, the issue of adaptation of representatives of different cultures, religions and, in the context of current geopolitical challenges, is an important challenge that should be regulated at the legislative level: "Travelling knowledge is not simply a case of edges versus empires of knowledge or vice versa. When an intellectual travels from empires of knowledge to the edges, or indeed when they travel from the edges to empires of knowledge, they will always bring intellectual baggage with them" [9, p. 637].

Within our research, there is a need to emphasize the contradictions which exist at the multicultural Ukrainian higher education environment. On the one hand, there are the presenters of various cultural traditions of religious beliefs, and on the other hand, even within the same country, we see the contradictions of communication between the Ukrainians, which are trying to integrate internally displaced persons, by the same persons. The new socio-cultural environment causes difficulties adapting also due to the perception of foreigners by university staff that do not have special training to work with such a category of students. Linguistic and cultural adaptation gets much faster when foreign students communicate intensively with local students, for example, in dormitories. It helps to establish relationships with other students, exchange information, improve language skills, which greatly increases the efficiency of learning.

The growing number of foreign students and significant funds entering the higher education system of Ukraine make incoming mobility an important branch of educational exports, while the foreigners themselves are the category whose interests must be taken into account and protected. International students sometimes encounter big difficulties in social adaptation. As it has already noted, this is isolation or the possibility of communicating with compatriots only due to the low level of knowledge of a foreign language, the inadequate involvement of mobile students in extra-curricular activities, student self-government bodies [14].

Taking into account the challenges initiated by displaced universities and internally displaced persons (academic community representatives), some groups are opposed to dominant discourses, enhanced by prejudice and clichés, which take root in the unproductive tradition of geographical determinism within Ukraine. In parallel, a large number of foreign students from different countries of the world come to Ukraine every year to study at higher educational establishments. In total, the geography of the countries, where students go, includes about 148 states: according to the Ministry of Education and Science of Ukraine, foreigners are studying at 228 of Ukrainian universities [15]. The Minister emphasizes that only over the past two years the number of Ukrainian higher education institutions where foreign students are study increased from 185 to 228: in 2017 almost 40 000 of invitations to education were issued, which is twice as much as in 2015, therefore, more than 66 000 foreign students study in Ukraine, but there were 53664 in 2011 [15].

Conclusions

The research defined the need to regulate the requirements for the language of instruction and its level of knowledge. Foreign students need to know what language they will learn (Ukrainian, Russian or English) and, if it is possible, begin to assimilate it before coming to Ukraine. After all, the responsibility for learning a language of instruction lies entirely on the "shoulders" of students, and not of universities, throughout the civilized world. European universities generally offer optional courses for studying English or another European language.

At the same time, the regional dimension of academic mobility and migration demonstrates the existence of a number of contradictions in the implementation of modernization processes in the field of higher education. The analysis of the legislation has demonstrated the crisis nature of the normative provision of academic mobility processes, reinforced by a complex geopolitical situation. Directly the processes of academic mobility and academic migration have "marginalized" status, despite globalization and current geopolitical challenges.

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Інформація та комп'ютерні технології

Information and computer technologies

Information and computer technologies.
Quantum computing

In the end of 1940s only few key scientists in the world involved into process of the invention of the computer engineering. They were John von Neumann end John Mauchly from the USA, Alan Turing from the UK, Sergey Lebedev from the USSR. The first brain-child of Sergey Lebedev was MESM - the first stored program computer in continental Europe. MESM was created in Kiev in 1949 (70 years ago). The first personal computers (PC) were created in 1960–1970. (The Soviet MIR series of computers was developed from 1965 to 1969 in a group headed by Victor Glushkov in Kiev). Computers have changed out lives globally.

The new page of space evolution of humanity — quantum computing.

The field of quantum computing was initiated by the work of Paul Benioff and Yuri Manin in 1980, Richard Feynman in 1982 and David Deutsch in 1985.

What can we say about quantum computing today?

Quantum computing can be viewed as the ultimate parallel computing utilising the quantum mechanical principle of superposition. Unlike the classical binary digits (bits) that form a two-state system ("0" and "1"), quantum bits (or qubits) can be in a superposition of states. This allows the quantum computer to explore large number of possible paths simultaneously.

The building blocks of quantum computing, qubits, can be realised in many different ways. Any physical system that can exist in a superposition of states can be used for quantum computing. The most popular choices for qubits are electrons (qubit is represented by electron spin), trapped ions (qubit is represented by the internal atom state) and superconducting loops (qubit is represented by the quantum states of electron current in two directions with different magnetic flux). There are also qubits based on photons (polarisation), neutral atoms, etc.

Quantum computing has three major advantages over the classical one. The first is known as quantum speed-up. It has been demonstrated that for a specially constructed problem an existing D-Wave quantum annealer can achieve 10^8 speed-up over its classical counterpart (simulated annealing algorithm run on a classical computer). It remains to be seen what rate of quantum speed-up we can achieve across the wide range of computational problems.

The second is energy efficient computations based on the principle of reversibility (preservation of information). All quantum computing operations are reversible, except the final measurement. In classical computing based on standard universal logic gates (such as NOT AND or NAND logic gate), operations are not reversible — the act of calculation leads to the loss of information. Statistical mechanics and information theory tell us that the loss of information should lead to the increase in entropy, i.e. to the generation of heat.

Finally, quantum computing can solve problems that are not solvable on classical supercomputers in finite amount of time. For example, simulation of complex molecules with numerous applications in chemical and pharmaceutical industries.

We are entering the period known as NISQ (noisy intermediate-scale quantum computing). This period is characterised by the general purpose quantum computers having between 50 and 100 logical qubits and specialised quantum annealers having several thousand physical qubits.

These quantum computers are powerful enough to "prove the concept", but not big enough yet to achieve true quantum supremacy. However, we are witnessing the exponential growth in the power of quantum computers. Also, practically all major technology companies now try to develop their own quantum computing capabilities, often in partnership with large financial institutions.

This means that we are probably closer to the widespread usage of quantum computing than we realise.

Chronology of the last achievements:

2016 -   NASA publicly displayed the world's first fully operational ($-15 million) quantum computer made by the Canadien company D-Wave at the Quantum Artificial Laboratory at its Ames Research Center California's Moffett Field.

2017 -   IBM announced that it has succesfully built and tested its most powerful universal quantum computing processors. The first is a 16 qubit processor that will allow for more complex experimentation;

-   a group of U.S. Researchers announced a quantor simulator (one equation) with 51 qubits. The announcement was made by Mikhail Lukin of Harvard University at the International Conference on Quantum Technologies in Moscow;

-   IBM research scientists use a 7 qubit device to model the largest molecule, Beryllium hydride, ever by a quantum computer (journal Nature);

-   IBM announced the availability of its most -powerful 20 qubit commercial processor, and the first prototype 50 qubit processor.

2018 -   Google Quantum AI Lab announced a 72 qubit processor called Bristlecone.

Розвиток когнітивної компетентності учнів у навчально-виховному процесі ЗНЗ засобами інформаційно-комп'ютерних технологій

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Abstract. У статті розкрито зміст поняття «когнітивна компетентність», складові названої компетентності; охарактеризовано організаційно-методичне забезпечення розвитку когнітивної компетентності у навчально-виховному процесі загальноосвітнього навчального закладу засобами інформаційно-комп'ютерних технологій. Представлено онтологію та хмарний сервіс Microsoft Office 365 як приклади інформаційно-комп'ютерних технологій. Презентовано техніку побудови онтології, наведено приклади побудови технологій учнями і вчителями. Розкрито зміст інтегрованого уроку з циклу природничих дисциплін з використанням хмарного сервісу Microsoft Office 365. Проаналізовано можливості використання названих інформаційно-комп'ютерних технологій у навчально-виховному процесі будь-якого закладу загальної середньої освіти.

Ключові слова: когнітивна компетентність, онтологія, онтограф, пірамідальна мережа, хмарний сервіс Microsoft Office 365.

Abstract. The content of the notion "cognitive competence" and its components is disclosed in the article; the organizational and methodical provision of development of cognitive competence in the educational process of a comprehensive educational institution by means of information and computer technologies is characterized. The ontology and cloud service of Microsoft Office 365 are presented as examples of information and computer technologies. The technique of ontology construction is presented, examples of technology development by students and teachers are presented. The contents of an integrated lesson from the natural sciences cycle using the Microsoft Office 365 cloud service are revealed. The author analyses the possibilities of using the named information and computer technologies in the educational process of any institution of secondary education .

Key words: cognitive competence, ontology, ontograph, pyramidal network, Microsoft Office 365 cloud service.

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Актуальність дослідження

Основною метою освіти сьогодення є формування і подальший розвиток надпредметних та спеціально предметних компетентностей. Експерти країн Європейського Союзу визначають поняття «компетентність» як «здатність застосовувати знання і уміння у нових ситуаціях» (Eurydice, 2002). У публікаціях ЮНЕСКО зміст поняття «компетентність» характеризується як «поєднання знань, умінь, цінностей і ставлень, які застосовуються у повсякденні» (Rychen & Tiana, 2004). Аналіз наведених визначень дозволив охарактеризувати компетентність як здатність ефективно застосовувати знання і уміння як у запланованих, так і у непередбачених навчальних та життєвих ситуаціях. Основою надпредметних (ключових) компетентностей є, на нашу думку, когнітивна компетентність. Розвиток названої компетентності має забезпечити успіх у формуванні і подальшому розвитку спеціально предметних компетентностей. В основі когнітивної компетентності знаходяться сформовані когнітивні механізми щодо здійснення процесу пізнання. Названий процес щодо обробки, відтворення інформації, появи нової інформації досліджували американські психологи Джордж Міллер та Ульрік Найссер. Так, Джордж Міллер займався моделюванням мислення за допомогою комп'ютерних програм, застосовував теорію інформації і статистичні методи для дослідження того, як людина переробляє інформацію в процесі навчання, робить певні висновки [7]. У педагогічних дослідженнях поняття «когнітивна компетентність» розглядається як форма «існування знань, умінь, освіченості в цілому, яка призводить до особистісної самореалізації» [3]; як «інтегральна якість особистості, що забезпечує її прагнення і готовність реалізувати свій потенціал» [2].

Засобом забезпечення системного засвоєння учнями великих за обсягом пластів інформації є метод інформаційного моделювання предметних областей на базі багатомірних тезаурусів, запропонований О.Стрижаком [4]. Використання названого методу допомагає вчителеві зберігати ресурси часу та інформації на уроці. Проте, недостатньо досліджено реалізацію системного підходу щодо розвитку когнітивної компетентності учнів на уроках з дисциплін як гуманітарного, так і природничо-математичного циклів засобами інформаційно-комп'ютерних технологій (ІКТ).

Метою статті є презентація змісту когнітивної компетентності учнів та організаційно-методичного забезпечення її розвитку у навчально-виховному процесі загальноосвітнього навчального закладу засобами інформаційно-комп'ютерних технологій (ІКТ).

Методи дослідження.   Було використано такі методи дослідження: теоретичний аналіз наукової літератури з метою з'ясування стану досліджуваної проблеми; моделювання, з метою опису техніки побудови онтології; аналіз продуктів дитячої творчості.

Виклад основного матеріалу дослідження

На нашу думку, *когнітивна компетентність — це інтегративне утворення, за допомогою якого відбувається пізнання об'єктивного сві-*

ту, самого себе і, як наслідок, генерація нових ідей, створення нових продуктів у певній галузі пізнання. Складовими інтегративного утворення є: *знання* у вигляді гнучких систем, придатних для застосування у різноманітних навчальних і життєвих ситуаціях, як інструмент пізнання об'єктивного світу; розвинені *інтелектуальні уміння,* які забезпечують здатність успішно здійснювати загальні розумові дії (аналіз, синтез, порівняння, аналогія, класифікація й систематизація понять і фактів), встановлювати причинно-наслідкові зв'язки, виділяти з потоку інформації головне і другорядне, і, як наслідок, робити обґрунтовані висновки. Названі уміння є підґрунтям уміння розмірковувати і планувати свої дії на декілька кроків уперед. На нашу думку, уміння планувати свої дії на декілька кроків уперед у пізнавальній діяльності передбачає добре знання навчального матеріалу, встановлення зв'язків між новим та раніше засвоєним, розвинуту уяву, вміння абстрагувати. Уміння розмірковувати пов'язане з умінням бачити проблему і усвідомлювати її; можливістю застосовувати раніш засвоєні (відомі) способи розв'язання проблеми у новій учбовій чи життєвій ситуації (переніс, підбір і аналіз фактів, знаходження зв'язків нового з тим, що засвоєно раніш тощо); висувати припущення щодо розв'язання проблеми; обґрунтовувати і доводити висунуті припущення. Виходячи з вище зазначеного, можна стверджувати, що уміння планувати свої дії на декілька кроків уперед та уміння розмірковувати пов'язані з рефлексією, а саме здатністю здійснювати самоконтроль у пізнавальній діяльності та оцінку досягнутого.

Саме названі складові є інструментом «відкриття» для себе нової інформації, яка є не механічним зібранням розрізнених частин, а чіткою системою взаємопов'язаних компонентів. Свідомо здобута таким чином інформація є підґрунтям успіху у навчальній діяльності, а потім — і професійній, стартом для створення об'єктивної новизни у певній галузі пізнання.

Когнітивну компетентність можна розвивати як на уроках з дисциплін гуманітарного, так і природничо-математичного циклів, створюючи онтології (опис системи знань певного розділу (теми) предметної галузі) та використовуючи хмарний сервіс Microsoft Office 365. Охарактеризуємо названі інформаційно-комп'ютерні технології.

Створюючи онтології, учні набувають вміння управляти інформаційними потоками, а саме: відбувається отримання інформації, її обробка, аналіз, перетворення (встановлення, наприклад, нових зв'язків).

Концептуальна модель предметної області або онтологія складається з графу (ієрархії понять) предметної області, зв'язків між ними і законів, які діють в рамках цієї моделі [1]. Побудова ієрархії понять є складним інтелектуальним процесом. Учневі треба дібрати необхідні поняття розділу (теми) певної навчальної дисципліни, визначити кожне поняття через підбір найближчого родового поняття і формулювання видової відмінносиі. Потім необхідно визначити семантичні зв'язки між поняттями певного інформаційного простору. І, врешті-решт, побудова семантичної мережі зв'язків понять. Пошук зв'язків між поняттями пов'язаний із кропіткою роботою із спеціальною літературою: підручниками, посібниками, тлумачними словниками.

Для побудови онтологій можна використати Web-додаток Graph Editor розташований за адресою `http://editor3.inhost.com.ua`. Формалізоване представлення предметної області представляється у вигляді мережевого графу. Терміни/поняття (об'єкти предметної області) описуються набором ознак або формують класи більш широких понять (класи об'єктів предметної області) за поданою нижче схемою в середовищі MS Excel.

Опис термінів/понять предметної області (об'єктів графу) набором ознак

Поняття A (спільна ознака α) ознака 1A, ознака 2A, ознака 3A,..., ознака nA

Поняття B (спільна ознака β) ознака 1B, ознака 2B, ознака 3B,..., ознака kB

. . . .

Поняття Z (спільна ознака ω) ознака 1Z, ознака 2Z, ознака 3Z,..., ознака mZ

Терміни (поняття) предметної області, занесені до першого стовпчику таблиці, відповідають батьківським вершинам графа, імена спільних ознак з другого стовпчика — назвам зв'язків між вершинами, імена ознак з решти стовпиків — дочірнім вершинам графу.

Різні поняття, можуть мати спільні ознаки. В такому випадку Graph Editor створює проміжні (неозначені) вершини, наявність яких означає утворення нових, раніше невідомих, понять предметної області (рис. 1).
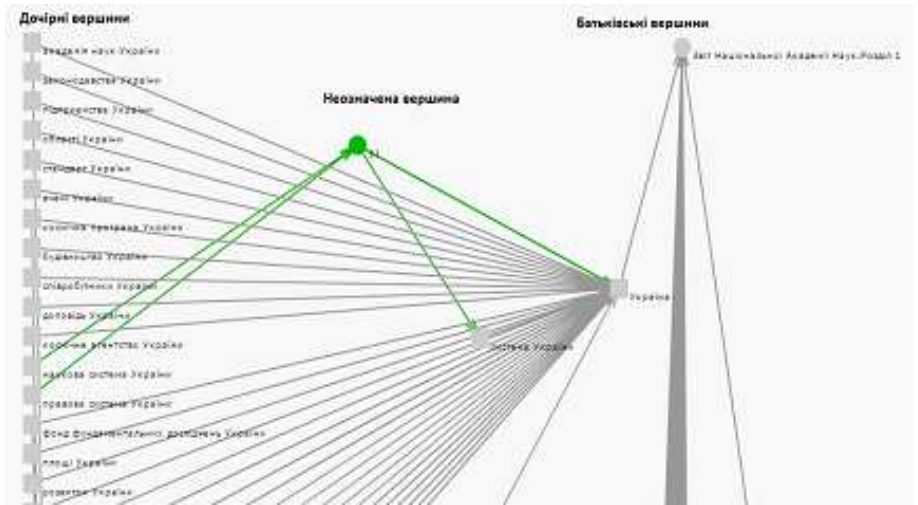
Рис. 1. Створення неозначеної вершини

Класифікація термінів/понять предметної області (об'єктів графу) за спільними ознаками (по класах об'єктів графу)

Клас об'єктів A (спільна ознака α) об'єкт 1A, об'єкт 2A, об'єкт 3A,..., об'єкт nA

Клас об'єктів B (спільна ознака β) об'єкт 1B, об'єкт 2B, об'єкт 3B,..., об'єкт kB

. . . .

Клас об'єктів Z (спільна ознака α) об'єкт 1Z, об'єкт 2Z, об'єкт 3Z,..., об'єкт mZ

Імена об'єктів, занесені до першого стовпчику таблиці, відповідають батьківським вершинам графа, імена спільних ознак з другого стовпчика — назвам зв'язків між вершинами, імена об'єктів з решти стовпиків — дочірнім вершинам графу (рис.2).
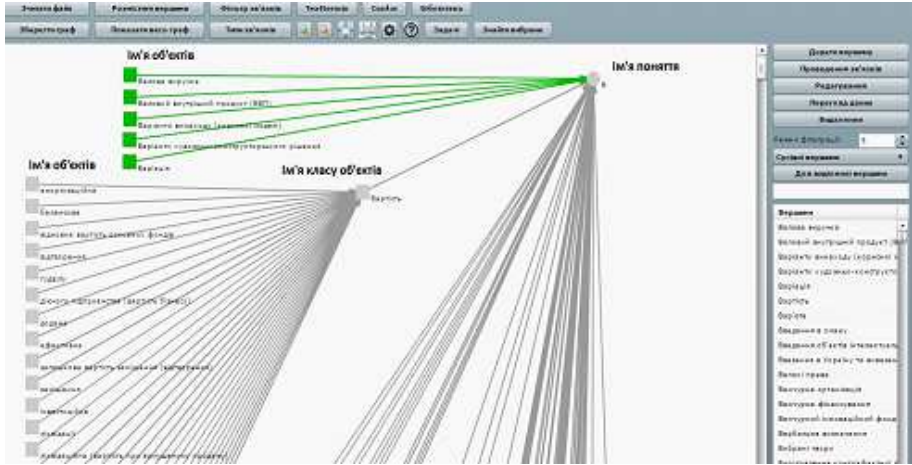

Рис.2. Структура онтографа

Таким чином ми отримуємо можливість побудови предметної онтології, яка описуватиме когнітивну схему (рис.3).
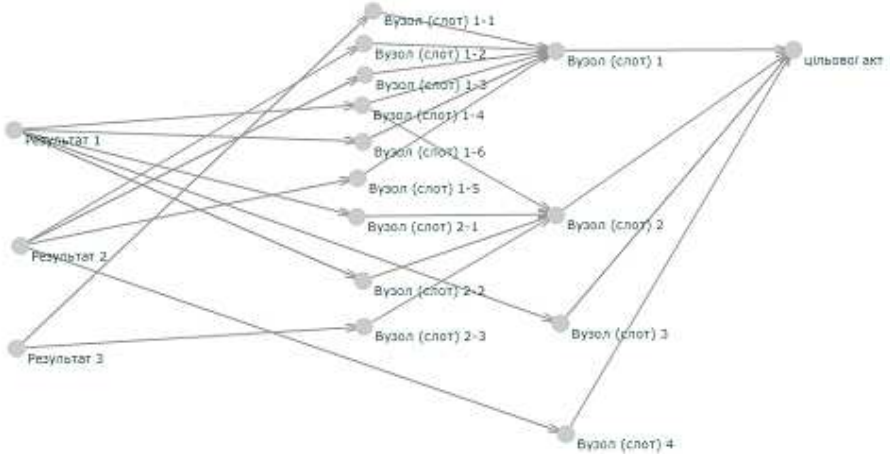

Рис. 3. Онтограф когнітивної схеми

Отже, онтологічний граф описує визначений набір суб'єктів, між якими існує визначена мережева взаємодія, зумовлена сукупністю інформаційних процесів, що її складають. Такі суб'єкти можуть бути представлені у вигляді функціональних вузлів, між якими взаємодія реалізується на основі використання їх множинної зв'язності [8, 9], що визначає її як відкрите мережецентричне середовище [5, 6]. Тоді ефективність взаємодії між просторово розподіленими структурами у мережецентричному середовищі забезпечується за рахунок стійкої й постійно прогресивно зростаючої зв'язності між контекстами об'єктів, які визначають певну функціональність і складають структуру її вузлів.

Цікавою для учнів і такою, що має потужний розвивальний характер є, запропонована нами, візуалізація графічного інтерфейсу у вигляді призми, приклад якої можна побачити за адресою `http://e-devel.inhost.com.ua/prism/?sharedgraph=G5a1160d72d3b6`.

Пірамідальна мережа може мати необмежену кількість граней. Для управління доступом до різних граней використовується консоль управління, відображена на рис. 4 зліва. Групи об'єктів відображаються на гранях, швидкий вибір може бути здійснений за допомогою навігатора на нижній грані (рис.5)
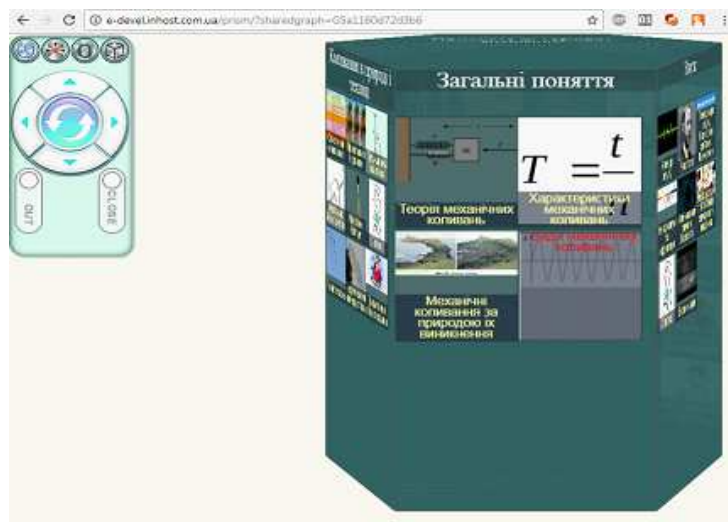
Рис 4. Реалізація графічного інтерфейсу у вигляді призми
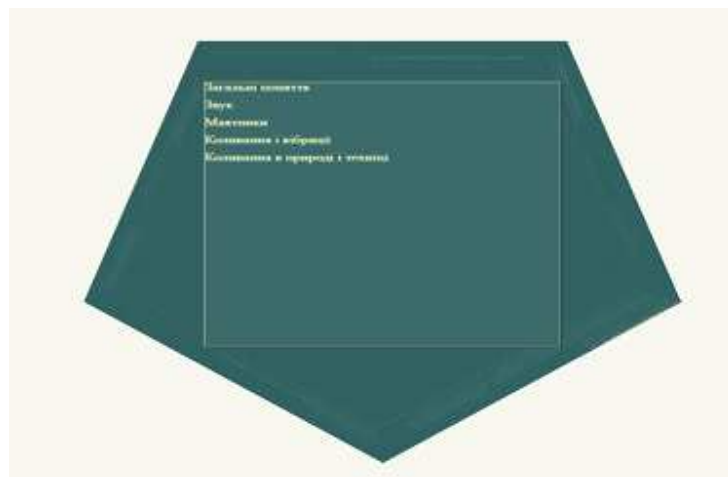
Рис 5. Навігатор при призматичному відображенні онтології

Так, наприклад, можна дати учням завдання із створення призми, пов'язаної з розв'язанням певної задачі. Одна грань (вершина графа) буде умова, друга — апарат розв'язання (формули). Третя — розв'язок. Четверта — життєві ситуації, де може знадобитись вміння розв'язувати такі задачі.

З метою забезпечення розвитку когнітивної компетентності вчителя триває процес створення онтологій уроків з різних навчальних дисциплін системи загальної середньої освіти. Так, за адресою `http://prism.inhost.com.ua/index.html?file=dc\%2FUroki-fizika10k.xml` знаходиться онтологічна призма (автор призми Кальной С.П.), яка відображає онтологію, що складається із уроків фізики для 10 класу загальноосвітнього навчального закладу (рис.6).

Рисунок 6. Онтологічна призма: «65 уроків фізики, 10 клас»

Дана призма є візуалізацією онтографа, фрагмент якого показаний на рисунку 7. Центральною вершиною (нульового порядку) є шкільний навчальний курс 10 класу. Вершини першого порядку являють собою основні теми курсу, а вершини другого порядку — навчальні заняття, що проводяться в межах цих тем. Кожна вершина містить описову інформацію (необмежену в розмірі) — контекст (рисунок 8). Контекст може містити малюнки, графіки, відеофільми тощо. Контекст не є замкненою системою — за допомогою гіперпосилань з нього можуть бути здійснені переходи на незв'язані джерела інформації.

За допомогою редактора онтологій, що має інтуїтивно зрозумілий інтерфейс та детальне описання, вчитель може створювати нові уроки, або із готового набору уроків може згрупувати новий. Існує можливість вилучити з уроку певну тему або додати її чи редагувати на власний розсуд. Таким чином, за мінімального навику, підготовка до уроку займає лічені хвилини. Побудова ж окремої онтології утворює так звану «капсулу знань», у якій сконцентровані відомості не тільки з конкретного питання, а і з іншими даними, визначеними конструктором призми та із вказаними взаємозв'язками.

Рисунок 7. Фрагмент онтологічного графу: «65 уроків фізики, 10 клас»

Рисунок 8. Контекст деякої вершини

Представлену таким чином візуалізацію об'єктної онтології ми пропонуємо використовувати за основу інтерфейсу різноманітних об'єктів (електронних підручників, каталогів, web-ресурсів, довідників тощо.

Потужним засобом розвитку когнітивної компетентності учнів є використання хмарного сервісу Microsoft Office 365. Для освіти цей сервіс стає доступним у всьому світі, в тому числі й в Україні. Інструменти для спільної роботи дають вчителям можливість забезпечувати освітній процес із будь-якого місця та будь-якого пристрою, використовуючи хмарну електронну пошту, календарі, портал та інструменти для відео-зустрічей. Office 365 для освіти включає звичний Office — пошту Outlook, програми Word, Excel, PowerPoint, OneNote, а також комунікатор для обміну по-

відомленнями та онлайн-зустрічей Microsoft Lync та портал для спільної роботи SharePoint.

Одним з прикладів використання названого сервісу є проведення інтегрованих уроків з циклу природничих дисциплін. Учні однієї паралелі знаходяться в різних кабінетах — фізики, хімії, біології. Перед ними ставиться задача: необхідно з різних точок зору (фізичної, біологічної, хімічної) розглянути одну проблему та представити рішення у вигляді презентації, яка створюється в хмарному сервісі Prezi (Presentation Software, Online Presentation Tools) `https://prezi.com`, доступ до якої одночасно мають учні з різних точок. Співпраця між учасниками даного проекту відбувається через систему безкоштовного он-лайн відео-аудіо-текстового зв'язку Lync.

Наведемо приклад такого інтегрованого уроку, який було проведено у 9-му класі спеціалізованої школи №304 м. Києва, основною метою якого є усвідомлення учнями засобів щодо охорони навколишнього середовища У ході уроку учні усвідомлюють теми з біології, хімії, фізики, а саме:

1) Біологія. Розділ «Надорганізмові біологічні системи», тема уроку: «Стабільність екосистем та причини її порушення. Біосфера як цілісна система. Захист і збереження біосфери»: .

2) Хімія. Розділ «Початкові поняття про органічні сполуки», тема уроку: «Значення природних і синтетичних органічних сполук. Захист довкілля від стійких органічних забруднювачів»;

3) Фізика. Розділ «Рух і взаємодія. Закони збереження», тема уроку: «Еволюція фізичної картини світу. Вплив фізики на суспільний розвиток та науково-технічний прогрес».

У ході проблемно-пошукових діалогів у підсистемах: «учитель-учні», «учень-учень» учні визначають фізичні параметри безпечної життєдіяльності людини за довідниковими джерелами, усвідомлюють значення вуглеводневої сировини в енергетиці; природних і синтетичних органічних сполук; усвідомлюють моральну та соціальну відповідальність за насідки вживання алкогольних напоїв; необхідність збереження довкілля для майбутніх поколінь, висловлюють судження щодо значення органічних речовин у суспільному господарстві, побуті, харчуванні, охороні здоров'я тощо; захисту довкілля від стійких органічних забруднювачів. Учні також усвідомлюють необхідність екологічно виваженого використання досягнень сучасної фізики для суспільного розвитку, вплив цього процесу на життя та майбутнє існування людей на Землі; визначають причинно-наслідкові зв'язки у взаємодії людини, суспільства і природи, орієнтуються на розуміння антропічного впливу на природні екосистеми, значення колообігу речовин у збереженні екосистем, роль заповідних територій у збереженні біологічного різноманіття, рівноваги в біосфері; налаштовуються на дотримання екологічної культури в повсякденному житті, участь у природоохоронній діяльності дотримання громадянської позиції в галузі збереження довкілля; з точки зору підприємливості та фінансової грамотності орієнтуються на усвідомлення відмінностей між природними та штучними екосистемами за показниками продуктивності й ефективності; усвідомлюють економічні оцінки природних екосистем та антропічного впливу на них; на-

слідки антропічного впливу на природні екосистеми для здоров'я людини; формується активна громадянська позиція в галузі збереження довкілля як одного з напрямів боротьби за здоров'я.

З метою розвитку когнітивної компетентності в учнів системними адміністраторами спеціалізованої школи №304 м. Києва було створено відокремлену мережу «Наука», за допомогою якої приєднано кабінети, в яких проходять уроки з дисциплін природничо-математичного циклу, до спеціального серверу, в якому наявна база відеоматеріалів, флеш анімацій, наукових відеофільмів, учнівських наукових робіт МАН тощо. Це дає можливість якісно використовувати мережеві ресурси при викладанні предметів природничо-математичного циклу. Так, при вивченні у 9 класі теми «Атомне ядро. Ядерна енергетика» вчитель стикається з проблемою недостатньої бази обладнання для проведення експериментів, лабораторних робіт щодо вивчення треків заряджених часток природного радіоактивного фону у дифузійній камері. Тепер для цього достатньо, маючи мережеві ресурси, приєднатись до Інтерактивного кабінету за адресою http://manlab.inhost.com.ua/online.html знайти необхідний розділ «Експеримент on-line» і мати можливість в реальному часі спостерігати дане природне явище. При цьому даний інтерактивний майданчик надає можливість, зареєструвавшись, замовляти необхідні експерименти.

Описана вище робота здійснювалася у межах експериментального дослідження всеукраїнського рівня на тему: «Оптимізація інформаційних мережевих ресурсів для забезпечення експериментальної діяльності учнів при вивченні природничих наук» відповідно до наказу Міністерства освіти і науки, молоді та спорту України від 02.08.2011 №921. Дослідження здійснювалося на базі спеціалізованої школи №304 м. Києва. Головним результатом дослідження вважаємо збільшення кількості учнів — переможців різноманітних конкурсів, олімпіад всеукраїнського та міжнародного рівня, а саме: Всеукраїнський етап міжнародного конкурсу ІнтелЕко (2016 р.) — 2 переможці, яких запрошено на міжнародний конкурс GENIUS Olympiad представляти Україну в м. Освего (США); Міжнародні інженерні змаганнях BEST (2015 р.); Всеукраїнська олімпіада LegoRobotica, переможці в номінації «Найяскравіша дизайнерська концепція».

Описану вище роботу можна здійснювати у звичайному загальноосвітньому закладі. Перш за все, необхідно зібрати данні про кількісний та якісний стан комп'ютерів навчального закладу, які використовуються при викладанні предметів природничого циклу; всі комп'ютери підключити до локальної мережі та до сервера школи, що дає можливість швидкого обміну інформацією та спілкуванню; провести моніторинг програм, які використовуються в навчально-виховному процесі; розробити план модернізації інформаційного середовища навчального закладу. Так, в процесі реалізації мети експерименту, в спеціалізованій школі впродовж 4 років була зміцнена матеріально-технічна бази школи за рахунок благодійного фонду «Розвиток 304», видатки сягнули порядку 530000 грн. Було придбане наступне устаткування: 15 ноутбуків, 15 системних блоків, офіційне програмне забезпечення, 9 інтерактивних комплексів, 9 LED телевізорів з підключенням до системи Інтернет, обладнано два кабінети Wi-Fiроутерами, оплата швидкісної виділеної лінії. Саме розвиток матеріально-технічної бази дав

змогу здійснювати навчально-виховний процес і цікаво, і результативно. Раціонально, із використанням комп'ютерної техніки проводяться близько 70% уроків природничих дисциплін.

Сьогодні, як ніколи, є можливості щодо знаходження джерел фінансування освітньому закладу, це і різноманітні стартапи, громадські проекти, також не виключаємо державну підтримку, тим паче було затверджено типовий перелік засобів навчання та обладнання навчального і загального призначення для кабінетів природничо-математичних предметів загальноосвітніх навчальних закладів, наказ МОН №704 від 22.06.2016 р.

Зосередимо увагу на навчальному плані. При проведенні даного експерименту закладом було обрано варіативний компонент — використання Microsoft Excel при викладанні фізики, що дало змогу розширити світогляд учнів, за рахунок збільшення годин (+2) та синтезу сучасного з фундаментальними законами. На нашу думку, саме це було рушієм в роботі з обдарованими дітьми, на цих уроках було проектування фундаментальних законів на площину сучасної інтерактивності, звичайно окрім Microsoft Excel було включено весь блок офісу Microsoft. У дітей виникла можливість розробляти програми, створювати симуляції, презентувати свої продукти.

Проте, необхідно зазначити, що результативність роботи учнів залежить не від кількості годин на вивчення дисциплін, не від матеріально-технічної бази, а від вчителя, його уміння працювати з названими технологіями. Сьогодні в кожного з учнів наявний сучасний гаджет — смартфон, достатньо поставити роутер в класі і весь клас вже в сучасному інформаційному середовищі, можна взаємодіяти з іншими учнями через різноманітні програми, додатки в смартфонах, бути одночасно в найкращій лабораторії найкращого університету світу, оглядати андронний калайдер, мандрувати Всесвітом тощо.

Висновок

Створення онтологій та використання хмарного сервісу Microsoft Office 365 допомагає вчителеві розвинути в учнів когнітивну компетентність, наявність якої характеризується розвиненим поняттєвим і дивергентним мисленням; умінням мислити, добувати, аналізувати і переробляти інформацію, адекватно оцінювати результати своєї діяльності.

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Лінгвістика та журналістика

Linguistic and Journalism

Development of interview taking competence by beginner journalists with the help of a psychophysiological component

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Abstract. In this article, the authors have researched interview-taking confidence as a necessary component of journalistic work. They have provided analysis of difficulty of interviewing instrument developing. They identify professional and psychological factors that prevent students of departments of journalism and beginners in media sphere to get necessary skills of professional communication. On the basis of a sociological survey, they have proved that beginner journalists realize difficulty of skills that form mastery of an interviewer. They have suggested a solution to the researched problem by qualitative learning of a theoretical component in the process of professional development. The authors have also suggested the recommendations on the application of psychophysiological component, which is an effective tool for overcoming the psychological and physiological difficulties that arise during the development of the competence of the interview.

Key words: interview taking competence, theoretical component, beginner journalists, psychological factors, psychophysiological component.

Introduction

Communication with people is one of three methods of gathering socially significant information in journalistic work, along with observation and studying documents. Professor I. Mykhailyn states: «with certain methaphorism one can say that journalistic work is an everlasting interview, and a journalist himself/herself has to be a good communicator. His/her work consists of talking to people and describing what he/she has heard»*(Mykhailyn, 2011, p. 330)*. Sometimes it happens that a camera crew is not on time to shoot material about an event, for example traffic accident or fire, and there are not any documentary traces yet. Thus, conversation with people such as witnesses, victims, firemen, the Emergency Ministry rescuers, officials creates working material for a mass media worker. In reality such communication appears often to be the main and self-sufficient way of getting initial information about a big part of the operative news.

In the context of cited above, in the textbook of the International Institute of Press it is indicated that interview is one of the most important

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instruments that journalists must use for getting information, checking data from the third sources, working out details, explaining facts, and getting opportunity to look at the things from different sides *(Guerrero, 2013, p.122)*. Journalists-beginners and especially students of department of journalism realize such feature of media profession. And this fact frightens them. Such reaction is better than surface self-confidence of pushy representatives of media sphere that used to rely on rough assertiveness and familiarity in communication with figurants of their publications. Especially in big cities, beginning media workers feel that their profession demands regular professionally specified communication with competent, respected people and people, who differ from them in their inside world. So, the necessity to get interview taking confidence by journalists-beginners determines actuality of this research.

Aims

The aim of the article is to research inter disciplined connections between successful developing of interview taking competence by beginner journalists and psychological factors that prevent a beginner of media sphere from becoming a qualified worker.

Discussion

First of all, a journalist is to be a communicant, psychologist, expert on knowing people. Ideally, he must inspire trust of any person. In the opinion of the authors of Journalistic investigation manual, «warm and open attitude let shorten the distance between a journalist and an interlocutor. And shortening of the distance is one of a necessary condition of confidence and getting the result of journalistic work» *(Biel, 2013, p. 100)*.

Ability to create confidential relations with an interlocutor is an important counter-evidence against always popular tendency to overestimate the significance of technical innovations in social communication. Being proficient in using dictaphone, camera or video camera of the newest model does not make a person a good interlocutor. On the contrary, in a journalist-cameraman tandem, the first place is traditionally given to a journalist, whose role is usually taken by a young talkative girl. She is the one who investigates circumstances of an event, reaches agreement with the figurants of the story about shooting interviews, tells the cameraman what shots should be in the future reporting story.

Hesitation of media beginners and their fear of an interview as professionally specified communication with socially significant people can be explained by the fact that students of department of journalism do not know what about and how it is necessary to talk to people preparing materials for mass media. As a result, there is a feeling that for a beginner journalist it is difficult to develop one of the most important professional competences, which is taking interview. Most often they have difficulties preparing portrait sketches and expert analytical materials.

In the English language the word «interview» indicates a large specter of varieties of professionally specified communication from a dialogue between a polyclinic doctor with a patient to a job interview. In all social sciences an

interview becomes more and more important method of gathering statistical, sociological, psychological information. Besides, academic experts of journalism and practitioners of the media sphere of Western and post-Soviet countries unanimously admit that the art of interviewing heroes of their materials is one of the fundamental features of a journalist, if not the main one. American researches have calculated that interview consumes from 80 to 90% of their working time, but more often than other methods it gives materials for publication, because the documents, used for preparing media materials, will not substitute people's testimonies *(Lukina, 2012, p. 7)*.

Ambivalence of an interview can be seen in its functional duality being at the same time a method of gathering journalistic information and a genre of publications *(Grigoryan, 2007, p. 26)*. A. Kolesnichenko thinks that ≪dual nature of interview also reveals itself it its simplicity and difficulty at the same time. The simplicity is in the fact that every person can ask questions and note answers, but not every journalist can get an individual talking, open him/her and lead up to certain formulations, spice up a conversation and add dynamic to it.≫Even professionals admit that sometimes they have very hard interlocutors and failed interviews *(Kolesnichenko, 2013, p. 90)*.

Analytics pay attention to a tendency of democratization of relationships between a journalist and an interviewent. Informational invasion forms a social demand for an explanatory role of media, the help in orienting in the sea of news and assessments. So, the role of a journalist as a guide in a socially significant subjects grows. More and more often journalists initiate dialogues with experts of social tendencies and witnesses of important events, try to estimate their words and hold discussion with them. This in turn increases many times the requirements to a journalist's competence. A. Ivashchuk pays attention to this trend: ≪It is obvious, that modern classical interview gradually gravitates toward transformation to a genre of interview, that has a dialogical character". As it has been cited above, this difficult genre is characterized by communication between a respondent and a journalist as equals. On the one hand, it gives an opportunity to a journalist to specify his/her question as much as possible, and if necessary to come back to it once again. On the other hand, the journalist, preparing to such an interview, study the problem and get oriented in its aspects, nuances and implications on the same level as the respondent≫*(Ivashchuk, 2013, p. 381)*.

In the opinion of A.Fedorova, interview is a difficult type of journalist work, because it requires maximum preparation to the subject and self-restraint in disclosing own knowledge on the topic. Interview requires not only sociability, self-confidence and tactfulness of a journalist in keeping conversation, but also ability to tune in on an interlocutor *(Fedorova, 2014, p. 190)*. O. Kuzmenko considers a personality of an interviewer, his/her attitude toward a respondent, his/her level of informational awareness and professional skills to be cornerstones of interview success *(Kuzmenko, 2016, p. 71)*. The researchers underline that high erudition and ability to comprehend socially significant problems quickly and independently are essential features of a mature interviewer.

Shortage of interviewing experience of students of department of journalism and beginners of the media sphere should be compensated by fundamen-

tal education that must precede compulsory practical activity in mass media. Education that students look down at and call «redundant and excessive»is to improve lack of life experience, broadmindness, deep understanding of people and social processes based on society members' actions and words.

A theoretical component will be «a redundant theory»if it stays unused for particular journalist tasks, if a student does not see any sense in developing techniques and methods of professional communication, getting skills of analysis of social life. It is important that, when facing a need to prepare journalistic publications, a student could feel lack of his/her cultural baggage. Having reconsidered his/her view at a journalism as a trade and set of technological solutions, a media-beginner should start growing his/her personal content as a potential professional.

Sociological research

It is important to find out how much beginners themselves realize their need in such skills. For that purpose, we conducted a sociological survey between students of departments of journalism of two institutions of higher education and young professionals of a private TV channel.

The research project «Interview-Taking Competence of Journalists-Beginners» has been conducted for revealing psychological factors of beginner journalists while taking interview. The project was realized by the research group Theophil Babienko Ukrainian Research Society commissioned by V.N. Karazin Kharkiv National University in the second half of 2017– the beginning of 2018.

The aim of the research is getting and processing sociological information of psychological condition of a beginner journalist during taking interview and testing the psychophysiological component.

The object of the research is beginner journalists that work in mass media.

The subject of the research is psychological state of beginner journalists while developing interview-taking confidence.

During the study it is necessary to fulfill following tasks: to find out the reasons that cause fear of beginner journalists before taking an interview, and suggest solution to the problem through personal and professional growth on the bases of a theoretical and psychophysiological component.

Among the research procedures are:

1) Analysis of public documents that include description of interview-taking competence, normative aspects of journalistic profession (legislative documents, work standards, ethical codices etc.).

2) Four expert interviews with journalists that have been working as editors, teachers and leaders of professional associations for a long time.

3) A survey of students of journalism and beginner journalists on a formulized form (printed or electronic form) — 168 respondents.

4) A list of methodical recommendations for approbation of the psychophysiological component among beginners journalists during the development of the competence of «interviewing».

Forming of research selection:

Quota formation of selection, «occasional» post survey:

- Sending to databases of mass media (more than 1500 addresses);

- Addressing to some professional journalist organizations;

- Publication in social network profile groups and distribution through public people;

- Addressing to the Faculty of Journalism of Ukrainian institutions of higher education;

Target selection of data:

Addressing to managers of Hope Channel Ukraine.

In addition:

Conducting a survey of beginner journalists and journalists-students of Ukrainian Institute of Arts and Sciences, Kyiv National University of Technologies and Design, young workers of Hope Channel Ukraine. Formation of general research selection is represented in Figure 1.
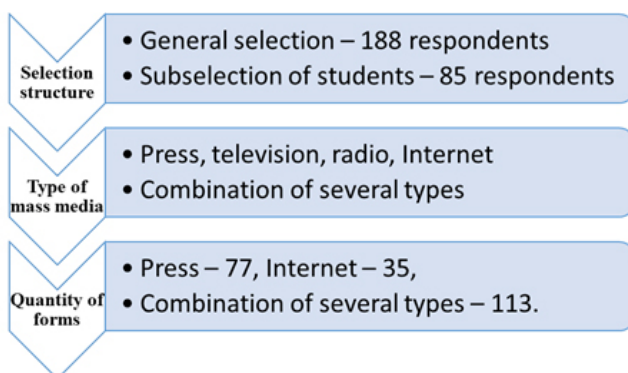
Figure 1. General description of research project selection

Sociological selection for the project «Interview-Taking Competence of Beginner Journalists» was formed to cover the main factological components that are basic for getting initial informational picture during sociological survey. Therefore, we payed attention to the age of respondents, sex and real working experience. In Figure 2. there are basic components of sociological selection of the research project.
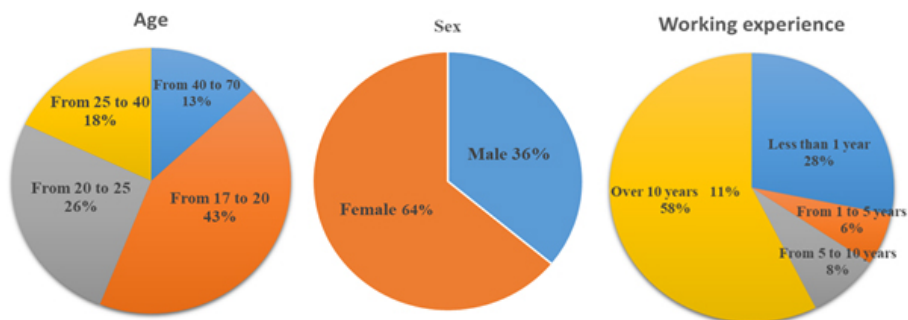

Figure 2. Basic components of sociological selection.

For experimental check of the existing problematics, which is developing interviewing competence, a special database of respondents had been formed that consisted of bachelors, masters and scientists who worked in mass media or taught students a journalist profession. In Figure 3 there is profile orientation of respondents and their quantitative structure.
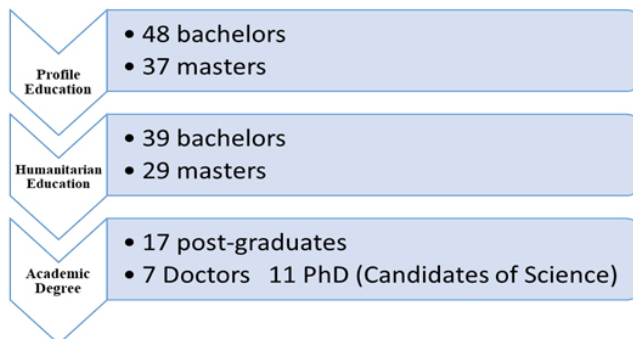

Figure 3. Profile orientation of the respondents.

Selection is representative, thus, it let us consider the results as manifestation of general opinion of journalism students and beginner journalists. Vision of future journalists and beginner journalists for their profession is completely agreed with the requirements, which are set out in the standard of journalistic profession that outlines the list of requirements for a journalist of multimedia publications and mass media. Beginner journalists think that top-priority

Table 1. Significance of journalist's activity component according to respondents' assessments (in %)

No.	Professional competences of journalists according to the passport of profession	3$^{rd.}$ year	4th year	5th year	Beginner journalist	Average index
1	Filling the news section	67,2	87,5	91,1	94,7	85,1
2	Conducting interview	22,7	31,8	38,2	44,3	34,2
3	Editing a text	55,1	66,9	79,1	84,9	71,5
4	Preparing descriptive headings	44,9	69,1	74,9	93,7	70,6
5	Monitoring of different mass media publications	87,3	90,4	94,7	98,2	92,6
6	Checking the accuracy of information	32,4	55,2	76,8	83,9	62,0
7	Gathering information on the basis of a survey	55,2	66,8	78,4	97,9	74,5
8	Media content promotion	9,2	13,7	76,3	88,9	47,0
9	Analysis of consumer market	–	–	12,5	87,2	49,8
10	Preparing reports	78,3	87,3	90,1	98,5	88,5

competencies of a qualified journalist are three important characteristics such as 1) organization and implementation of journalist work, 2) formation of informational content, 3) development and support of journalist work at the high level of quality. In Table 1 there are results of a survey on an attitude of students of journalism departments of Ukrainian institution of higher education toward interview-taking competence.

Evaluation of requirements to a modern journalist according to the standard, made by beginner journalists, depends on age and involvement in mass media. Along with growth of academic years, evaluation of personal competencies in the sphere of journalistic activity increases. First and foremost, it is connected with improvement of skills and enlargement of experience in the sphere of journalistic work. Along with this, improvement of interview-taking competence does not exceed 50% even on the level of beginner journalist. It shows that development of interview-taking competence is the most difficult step for most of students and beginners in the sphere of journalism.

To reveal the basic psychological reasons that prevent students and beginner journalists from successful development of interviewing competence, a targeted survey was conducted that let us define problematic moments and give recommendations on their solution. Evaluation (in %) of the importance level of interview-taking competence is made by students and beginner journalists. As it can be seen from Table 1, 83% of respondents realize that taking interview is an important component of journalistic work that is needed to be developed by every beginner of the media sphere. In Table 2, there are the most common psychological factors that, according to respondents' opinion, prevent them from feeling confident in the process of interviewing a respondent.

In the process of analysis of Table 2, following data were determined that show attitude of students of journalism and beginner journalists toward interview-taking competence. The majority of the respondents in most cases prefer working with documents (74,6%) more than live communication with respondents. The main reasons of such choice are own psychological tension (68,1%), difficult character of a respondent (79,3%) absence of additional questions (73,9%), communication with a stranger (78,9%), social status of a respondent (79,8%). Respondents were suggested some variants, what way, in their opinion, it is possible to overcome the mentioned difficulties as soon as possible. The majority agreed with the fact that improvement of practical skills and long working experience can help to solve psychological problems in the process of development a skill of taking interview. It is interesting, that only 24,1% of the respondents consider that a theoretical component is an important part of becoming a professional journalist. According to this, we believe that while teaching journalistic subjects it is necessary for teachers to emphasize not only development of skills in the process of practical work, but also to explain that development of a theoretical component is a guarantor of substantial outlook development of a media sphere worker's personality. Besides, the majority of respondents (89,6%) agree that a highly qualified journalist must develop professional skills in complex including interview-taking competence.

Table 2. The list of psychological factors of journalists-beginners while taking interview

Psychological factors	3rd year	4th year	5th year	Begin-ner jour-nalist	Average index
What do you prefer in the process of journalistic work?					
Working with documents	88,6	73,7	69,8	66,4	74,6
Taking interview	7,0	23,2	28	33,5	22,9
Difficult to answer	4,4	3,1	2,2	0,88	2,6
Do you like taking interviews?					
Yes	10,6	20,7	31,2	40,1	25,6
No	89,4	79,3	68,8	59,9	74,3
Have you ever felt uncomfortable while taking interview?					
Yes	95,2	89,4	79,3	69,1	83,2
No	4,8	10,6	20,7	39,9	16,7
What make you feel uncomfortable most of all while taking interview?					
Own psychological tension	89,5	77,4	54,2	51,3	68,1
Difficult character of a respondent	92,4	87,7	73,1	64,2	79,3
Absence of additional questions	98,4	82,1	63,3	51,9	73,9
Communication with a stranger	98,1	89,3	75,6	52,6	78,9
Social status of a respondent	99,3	87,2	78,1	54,9	79,8
What helps you to overcome the difficulties while taking interview?					
Long experience of work	99,4	98,7	97,3	99,3	98,6
Improvement of skills	77,2	79,1	89,7	83,9	81,7
Personal growth as a professional	65,3	48,8	87,3	91,8	73,3
Higher education	98,3	98,7	98,1	86,4	95,3
What instrument is the most important in learning the art of taking interview?					
Effective learning of theoretical basis of interview	12,3	17,9	19,2	47,3	24,1
Constant practice in the sphere of interview	98,4	98,5	98,3	99,4	98,6
Natural talent of communication	99,4	99,5	99,4	99,3	99,4
A journalistic profession covers a wide range of professional skills, so, in your opinion, is it important to develop all the skills in complex or is it better to do just what you are good at?					
Develop all skills in complex	87,4	88,5	87,4	95,2	89,6
To do more what you are good at	8,1	8,4	8,8	3,7	7,2
Difficult to answer	4,5	3,1	3,8	1,1	3,1

Practical application

In order to solve the psychological problems revealed during the survey, a complex of psychophysical exercises entitled ≪psychophysical component≫ was proposed, the essence of which is to select and apply them before interviewing. The selection of exercises is carried out individually in view of the temperament of the journalist, since the active temperaments (choleric, sanguine) need to calm down and streamline their thoughts, because these temperaments are excessively verbose at moments of nerves, which may not always be a useful side during an interview. In the case of passive temperaments (phlegmatic, melancholic), excitement and nervousness are expressed in the oblivion of prepared questions, resulting in the journalist being tied to complex questions and unable to use questions that may arise during the discussion *(Nedopitanskiy, 2009, p. 52)*. Conditionally, personality of a journalist at the beginning of an interview during interviewing consists of four components, each of which has its negative component, which manifests itself in situations requiring high responsibility, namely interviewing, Fig. 4.
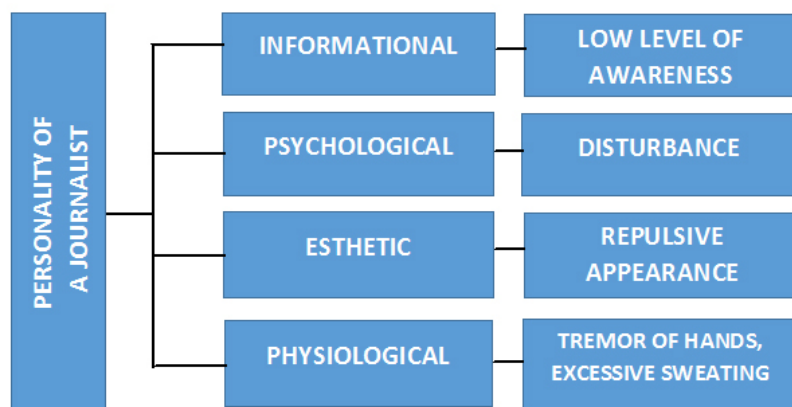
Figure 4. Components of the individual journalist beginner and their negative effects during the interview

The information component of the personality of the journalist beginner includes the general information preparation for the interview, which involves preliminary knowledge of the journalist with the subject, personality of the respondent and the compilation of a number of questions. If a journalist is a beginner who has failed to perform qualitatively these phases, there is a lack of information, which is caused by the emergence of tension between the interlocutors. In order to neutralize this problem, it is necessary to apply three actions, namely:

1) General questions in writing (to be applied during the preparation for the interview). Facilitate brain activity and development of atmosphere between the journalist and the respondent.

2) Learning and repeating problem questions (necessary for constructing a structured dialogue). This is an appeal to the respondent's feelings and an opportunity for the journalist to gather opinions until the respondent answers the question.

3) The lyrical digression should encourage the respondent to tell you information related to personal experience (applied at the time of the emergence of tension). We recommend that you ask the respondent for advice on the issue related to the topic of the interview. The frank interest will enable you to activate and arrange your conversation.

The psychological component of the journalist beginner is manifested in excessive apparent disturbance, which prevents him from feeling freely during the dialogue and causing anger or compassion in the respondent. These components negatively affect the quality of the information received, as the respondent does not feel free to talk and may not deeply cover the questions posed to him. Neutralization of the negative manifestation of the psychological component is performed by means of breathing exercises and facial gymnastics *(Sakazli, 2012, p. 37)*. These recommendations help balance the nervous system and tune in to conversation, since their application involves partial relaxation of the body of the journalist.

The aesthetic component of the personality of the journalist implies the presence of a pleasant appearance in the journalist, as it is easier for people to communicate with those whose faces are acceptable and sympathetic to them. The second aspect of the aesthetic component includes the selection of appropriate clothing, which will not distract the respondent during the interview. A pleasant and well-groomed appearance for 30% increases the effectiveness of the interview *(Golub, 2016, p. 67)*. Everyone has own rules of care and a professional dress code, but they should not go beyond what is allowed. This advice is relevant to every profession.

The physiological component is manifested in trembling hands and disturbance, which is expressed in stuttering and excessive sweating. For neutralization we recommend to perform a complex of light physical exercises, which cause movement of blood in the body and reduce stress. Thus the essence of the psychophysical component can be represented as follows:
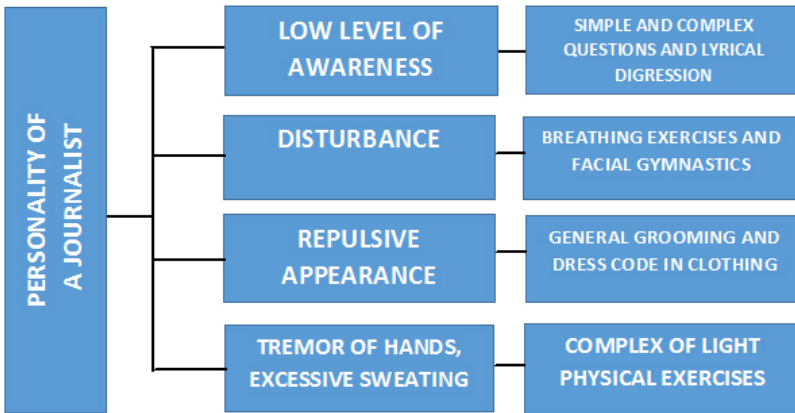

Figure 5. Scheme of application of psychophysical component

After testing the psychophysical components of the journalists, they received the following feedback from the journalists beginners: «I was always worried during the interview and I forgot to put half of the questions that were asked, but after exercising my face before the interview, my excitement

decreased significantly≫; ≪After my beginning to learn to interview, I noticed that during the dialogue I swallowed the ending of words, but using gymnastics for my face helped me overcome this problem≫; ≪It's unpleasant to say this, but the problem of tremor of hands and excessive sweating prevented me from talking with the respondent, because I noticed that my wet hands are an unpleasant aspect when they meet with the respondent; it is the complex of picked up easy exercises that helped me to reduce tremor of hands, although the problem of humidity still left≫; ≪I always liked my style in clothes, but I noticed that respondents who have been reacting to the appearance of my tastes in clothes for over 40 years≫.

Therefore, from the above, one can conclude that the psychophysical component is an effective tool that helps journalists to overcome the difficulties that arise during the development of the competence of the interview.

Conclusions

As a result of the conducted theoretical and sociological research, it is possible to make following conclusions:

1) Students of journalism and beginner journalists feel psychological tension in the process of development of interview-taking competence.

2) In most cases psychological tension is caused by a respondent, if he/she possess a higher social status than a beginner journalist.

3) It is possible to overcome psychological discomfort of beginners with the help of two instruments such as development of practical skills and constant usage of a theoretical component.

4) The problem of psychological tension was explained by the fact that the majority of the respondents (24,1%) neglected development of a theoretical component, thinking that the discomfort can be overcome with the help of long working experience.

5) We recommend to use effectively a theoretical component in parallel with development of practical skills that will let media workers to form substantial thinking, which is the basis of communication with different representatives of the society.

6) The use of the psychophysical component in the complex reduces the psychological and physical stress that accompanies journalists beginners when taking the first interviews.

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Linguistic support for the formation of a consolidated information resource of social memory institutions

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Abstract. In the article it is analyzed the role of linguistic means as the most important, system-forming elements of any information and library system, including a consolidated information resource of social memory institutions. Metadata of library digital electronic resources, archives and museums is characterized as a fundamental linguistic support of consolidation process of these resources and simultaneously as means of human and machine interaction in the development and operation of a consolidated information resource. It is outlined the criteria for choosing linguistic means of the development of machine-readable descriptions of information resources for the consolidated information resource of social memory institutions in a smart city.

Key words: linguistic support, metadata, machine-readable information, human-machine language, consolidated information resource, institutions of social memory.

Introduction

The stereotypes of relationship between social institutions and society as whole and individual users in particular are changing under the influence of social and cultural and technological changes in the modern world. In new conditions the institutions of social memory (libraries, archives and museums) as the most open communication structures, not just are as objects of information process, rapidly mastering electronic technologies, but also play a significant role as subjects of this process. Using computer and technological tools in the library and information activities, not only substantially accelerates and improves the quality of customer service, but also changes the whole range of existing technologies. Automatization provides a range of new, previously in-

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accessible possibilities for information workers and leads to dramatic changes in the information service.

Among the various forms of communication in the institutions of social memory the document communication dominates based on the use of printed and electronic documents. They can be considered as a process of interaction in particular area and suggest the involvement of two or more subjects. These institutions, based on the specifics of their information resources, promote efficient social and communication activity of specialists using special knowledge. Document communication of experts carried out in each of these institutions is not only in their physical space, it forms its contacts with users and in the online mode. At the request of the information society every artifact of cultural heritage, e.g. a book, an archive document or a museum exhibit, should be presented in the form of a digital document that is accompanied by a full comprehensive description of a source that satisfies the deepest information request. Sets of such digital documents form electronic collections and consolidation storages from different origin and content of electronic collections called digital (or electronic) libraries as ways of description and systematization of information resources because they are close to the library cataloging.

Main results

Document and communication direction is leading in the activity of social memory institutions. It is associated with the creation of system directories — the sources of secondary document level, such as descriptions, catalogs and indexes, lists, surveys, registers of displaced values as well as documentary sources, history and culture instructions and other activities, including research products in the form of monographs, collections of scientific papers, articles and surveys [1].

The processes of information transfer that occur between a person and a person in the broadest sense are considered as information distribution between individuals and groups and are defined as a process of message delivery. Today, the communication process in the electronic library imposes new requirements for electronic communication in comparison with normal one, based on natural language, so the important components of communication in the library is a correct combination of natural and artificial languages. They are used to support the knowledge transfer with the difference that an artificial language can be directly used for encoding digital information.

Electronic communication takes the dominant positions with nonlinear structure, because it is possible to solve problems of integrating the whole intellectual potential of society into the documentary communications and ensuring its most efficient further use [2].

The rapid growth of electronic resources has changed the practice of fund management of libraries, archives, museums, greatly complicating it for different reasons, such as accounting standards of licensing and copyright, the need for conducting business negotiations on access to information, the need for internal planning while forming funds. In the electronic environment, the level of attention given to the format is similar to a semantic component of accounting documents.

Providing access to information resources, the most complete disclosure of information that is stored in libraries, archives, museums is only possible with the use of modern methods and means of information transfer, mastering the complex of linguistic tools to submit the document content in a user friendly manner and thereby ensure appropriate information service. Unfortunately, the problems of library technology and, in particular, the technology of semantic document processing, from which it is depended the access reliability to information resources and the quality of customer service to ensure their information needs, have been on the periphery of scientific interest of researchers for many years.

Electronic libraries are specific enterprises of providing information services and they are simultaneously repositories of information resources, processing them by means of information retrieval languages and indexing methods.

Modern software and hardware allow creating a comfortable environment for a user while working with an electronic catalogue, providing a wide range of service capabilities such as establishing quickly the existence of a specific document in the funds and its location, providing search of the required data in the workplace or at home, getting access to its digital copy. The most important characteristic when evaluating search capabilities of electronic catalogues is their semantic component and linguistic support of electronic catalogue, which forms the communication interface between a user and a digital library.

Actually, user communication with an electronic library comes down to human-machine interaction through a dialog system, search queries, a selection of appropriate properties, and introduction of specifying characteristics. This interaction is supported by linguistic means.

In the conditions of absence of a single research, scientific, methodological and information center for the development and maintenance of linguistic means, electronic libraries face with a number of challenges in practice, unresolved at the theoretical level, the largest of which is the problem of communication between a man and a computer [3]. Live, that is written or oral communication with a machine is a dream of every programmer. Some people believe that any attempt to mechanize language is impossible. Language as a resource and as a means of expression is something only appropriate for a human, or at least for the process of reality representation by a human. The language can be contrasted with one linguistic phenomenon retaining a lot of its properties at the same time is prepared to become an object of mechanization, while remaining a natural means of human expressions. This is a phenomenon of business prose that is a language carrier of industrial relations of people [4].

Speaking about a human and computer interaction using natural language, it is important to note a need and an opportunity to teach the computer to understand and accept fully a business prose. It is unreal to extend computers in all areas of industrial relations and ensure their appropriate interfaces in the form of formal regulations, standard forms and other means of information preparation. Time for processing or document synthesis is always compared to its time performance. However, the number of human and computer interfaces in dialog systems continues to grow [4].

The most important feature of business prose is that it always operates within the simulated situation unlike "live language", it is always internally

formalized, and no matter whether a user is aware of this. Another specific but important feature is clarity of functions of each message. When a user sends an order for execution, makes an information request, perceives the received information, they should firmly know what a sender or a recipient wants.

Metadata is one of the linguistic means providing clear and unambiguous description and searching "visibility" of information resources. There is a wide variety of interpretations of metadata meaning, but we have chosen the following one: "Metadata is structured information about a resource of any type, which is used to identify a resource, to describe a resource, to manage a resource and provide an access to it" [5].

Interpreting the term metadata as "data about data", researchers often draw an analogy with the methods of library cataloging that is creating records for information resources. S. Gradman offered to avoid this identification in 1998 at the IFLA General Conference in Amsterdam [6], assuming that metadata belongs to a specific type of materials, namely electronic resources and metadata relation to the source document strongly differs from the relation of catalog records to library books, because they are technologically stronger related to the original than the catalog descriptions. Around the same time, the founder of WWW Tim Berners-Lee pointed out even deeper difference which is crucial for metadata of digital information resources [7]: "Metadata is machine-readable information on web resources on the Internet. The machine-readable word is a key ..."

The various standards for metadata presentation are developed for different types of information resources. They enable the unique presentation of information, increase the reliability and the quality of object description, enhance the quality of documentation, opportunities, completeness and accuracy of information retrieval, and ensure the data compatibility.

Standard metadata can be focused mainly on the description and documentation of objects to search for information or exchange and storage of information. But essentially any standard metadata serves each of these functions to a greater or lesser extent [8].

Metadata standards can be seen as a human-machine language. A human describes the properties of an object in accordance with the standard requirements and they are given in machine-readable form suitable for computer operations, including processing, search, visualization, data exchange with other computer systems. Such machine-readable representation is called a format.

Brakker N. V. highlights in a standard as in any language, vocabulary, syntax and semantics. The human vocabulary includes a name of metadata elements (fields, attributes), lists of terms, thesaurus, authority files in natural language. The designed vocabulary for computer contains names of metadata elements (tags) and other elements of programming languages (e.g., XML).

Syntax defines the role of metadata elements and their relation to each other, defines the logical structure of metadata and corresponding rules that are called metadata scheme for a computer.

Semantics is a semantic metadata content, a pointer to the specific properties of an object. It is determined primarily by a human, but a computer can enrich semantically metadata, for example, adding concepts to lower levels of thesaurus [8].

Today information workers of social institutions that form integrated electronic libraries, the task of creating a unified electronic catalog containing descriptions of library, archival and museum resources, see a definition of "a nuclear set of data elements" based on the standards of all kinds of resources. Thus, this data set should be able to identify the resource, get an access to it by means of electronic library catalog, and it should be implemented a transition to more information, to owners (holders) of originals of resources or to a complete original description in text form [9].

Each of the existing formats offers the set of data elements, depending on the origin of the information resource and the purpose of this description. There are different approaches to the classification of metadata standards. But the biggest problem for professionals working with integrated digital libraries is selection / development of an optimal unique standard that can provide a comprehensive description and quick and quality access to resources of historical and cultural heritage, stored in different social memory institutions (libraries, archives, museums). Studies of consolidation of information resources from heterogeneous sources through the use of metadata standards are found in the works of Western scholars such as Erik T. Mitchell [10], Seth van Hooland [11], Richard Gartner [12], M. Woodley [13], Carolyn McCallum [14], C. Willis, J. Greenberg, H. White [15].

As a means of basic metadata to describe a large class of digital objects is commonly referred to DCMI (Dublin Core Metadata Initiative). This standard is used as a "minimum standard" of metadata to search resources and as a basis for other standards [16]. The prevailing operating standards of metadata description contain elements of Dublin Core or are its derivatives. From a linguistic point of view it is simple in implementation, so it can be recommended as a unique human-machine language to describe heterogeneous information resources to their consolidation within an integrated digital library, which, in particular, may be a consolidated information resource in institutions of social memory [17].

The task of linguistic study of human-machine language is especially relevant in connection with the development of artificial intelligence systems. For those systems it is typical to use adapted natural language in input, output and inside, and its functioning within the system could serve as a prototype of the language, serving as a mediator, an intermediate language between a natural intelligence and a natural language, which is an important element in making the keyword list in generated metadata to a document and information requests [18].

Consequently, the functional aspect of the XXI century library returns to its roots and becomes not only a library, but a repository of heterogeneous elements of humanity accumulated experience, knowledge, cultural and scientific values. Funds of modern electronic libraries are not connected to a single physical location, and consolidate information about available information resources using linguistic means. Along with the performance of traditional tasks of document and communication center, a digital library must ensure the implementation of full technological cycle of intelligent information technologies from bibliographication to the allocation of new knowledge from data warehouse and provide them to users. Linguistic means play a significant role linguistic tools

that are among the most important systemic elements of any information and library system. Their quality determines the effectiveness of the work of the whole system.

The rapid introduction of the new information technologies into the practice of libraries influenced on the development of linguistic software in recent decades. Understanding and using the effects of this exposure are considered to be appropriate, including the formation of consolidated information resources in institutions of social memory. Implementation of such information resources at the level of each city as a part social and communication environment of sociopolis will promote the principles of quality information service of residents and visitors in modern smart cities.

The formation of consolidated information resource of a smart city is based on the use of modern information and communication technologies, a certain order of development and operation of facilities, means of submission and processing poly-model information. An obtained information product as a result of systematically informed actions usually contains unified information of different types and use for its processing and presentation of diverse special technical devices, software and algorithmic and linguistic tools. This ensures the preservation of positive characteristics of traditional methods and forms of information transfer and reproduction and a maximum use of new features of modern information technologies, such as interactive communication, search and sort by set criteria, mobile access to information resources, and integration with the Internet.

Conclusion

Therefore, the choice of linguistic means for the development of machine-readable descriptions of information resources for the consolidated information resource of the institutions of social memory in the city must ensure the possibility of achieving the goal of its functioning, and it is to provide the widest and the most convenient access to information digital resources of libraries, archives, museums. To achieve this goal, it is expedient to use information-oriented metadata created purposefully by information workers, for example, using a minimal set of elements of the Dublin core, and so-called "user metadata" created in the process of social communication in social networks that can provide the necessary depth of linguistic identification of the artifact description of cultural and historical heritage for further convenient search.

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Дослідження історії культури

Studies on the history of culture

Between the Land, Sea, and Sky: Some Words on the Art of the Minoan Civilization of Bronze Age Crete

Tetiana Danylova[1]

> Crete's mystery is extremely deep.
> Whoever sets foot on this island senses
> a mysterious force branching warmly
> and beneficently through his veins,
> senses his soul begin to grow
>
> *Nikos Kazantzakis*

Abstract. Usually, our knowledge of history, society, and culture is based on the written sources. However, the Minoan texts are extremely few. Thus, the Minoan art appears to be almost the only source of our knowledge of the Minoan civilization and culture. This paper attempts to analyze the phenomenon of the Minoan art of Bronze Age Crete. Discovered by A. Evans, the Minoan civilization — an Aegean Bronze Age civilization — flourished on the island of Crete and some other Aegean islands, in particular on Thera/Santorini with its settlement of Akrotiri. For quite a long time, the Minoan civilization had been labeled as peaceful making reference to Minoan Thalassocracy, "Pax Minoica", and a rather small number of fortifications. The lack of written information has given vent to researchers' fantasy and the idea of the Minoan culture as the Golden Age of humanity was not accidental: the Minoan artists portrayed life as a continuous flow of beauty, an endless game, in which fleeting emotions and joy become the spring of happiness. Later, the conception of peaceful Minoans was re-evaluated. Evans's reconstructions were subjected to serious criticism from the standpoint of contemporary archeology. However, we can "throw out the baby with the bath water". We do not have to accept everything Evans stated about the Minoans, but we should be grateful for his profound inquiry into the unknown world of the human past. The Minoan art is important for contemporary humans because it draws attention to a harmonious life in the world of here and now; it carries an incredible power of inspiration and beauty; it brings a feeling of lightness, joy and a happy flight of a soul into our lives. And that really matters.

Keywords: Minoan Art, Minoan civilization, Arthur Evans, Crete, Palace of Knossos, Minoan frescoes.

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Introduction

Relevance of the study.   The world around us is so beautiful that it is almost impossible to pass by blooming flowers, full moon, frolicking animals, blazing sunsets, ever changing deep sea, unique landscapes, good-looking people and remain indifferent. We stand in reverence and gratitude facing with something that is more than our habitual perceptions — with something that leads us to the new spiritual heights. One of the cultures whose art is permeated with a sense of beauty woven from the sun and sea was the Minoan culture.

The Minoan civilization — an Aegean Bronze Age civilization — flourished on the island of Crete and some other Aegean islands, in particular on Thera/Santorini with its settlement of Akrotiri. According to the widespread hypothesis, the eruption of the Santorini volcano destroyed the Minoan civilization of Crete; this formed the basis of the legend of Atlantis, which was described by Plato in his "Timaeus" and "Critias" dialogues [20]. Still now, the lost city of Atlantis is one of the most enduring myths. Many suggestions have been put forward as to Atlantis location; Crete and Santorini are among them. Many of the details of the Atlantis legend fit with what is known about Crete and the Minoan civilization. On the other hand, the history of the Minoan civilization does not correlate with the location and time of existence indicated by Plato. Some explorers suggest that such inconsistencies are just the result of the mistaken translation [12], while others totally deny the Cretan/Santorini hypothesis of Atlantis [7]. "Description given by Plato of Atlantis can be matched to numerous places around the world; and so the probability is that no site will ever be confirmed as Atlantis, even if Atlantis is real. Any archeological site would have to come complete with a sigh saying "This is Atlantis", otherwise doubts would always exist" [25].

The Minoan civilization was discovered by the prominent British archeologist Arthur Evans (1851–1941). He excavated the ruins of the ancient city of Knossos. Starting his work in Crete in March 1900, he was amused: "The extraordinary phenomenon: nothing Greek — nothing Roman — perhaps one single fragment of late black varnished ware among tens of thousands. Nay its great period [that of Knossos] goes at least well back to pre-Mycenaean period" [11, p. 317]. Evans was so enthusiastic about his findings that he devoted the rest of his life to the re-discovered civilization, which he called the Minoan civilization. It was named after King Minos, the legendary ruler of Crete and the son of Zeus and Europa. Along with Evans, after the liberation of Crete from Turkish control in 1898, a number of archeological interventions have been carried out by Italian archeologists at Phaistos, British at Kato Zakro, American at Gournia.

Archeologists use two systems of chronology of the Minoan civilization. The first was created by Evans and modified by the other archeologists: Early Minoan/Early Bronze Age (c. 3600 — c. 2100 BCE); Middle Minoan/Middle Bronze Age (c. 2100 — c. 1600 BCE); Late Minoan/Late Bronze Age (c. 1600 — c. 1100 BCE). Another Minoan civilization timeline was introduced by a renowned Greek archeologist Nikolaos Platon (1909—1992). It is based on the development of the architectural complexes — palaces at Knossos, Phaistos, Malia, and Kato Zakro. Platon divided the Minoan civilization into Prepalatial (c. 3500 — c. 1900 BCE); Protopalatial/Old Palace Period (c. 1900 —

c. 1750 BCE); Neopalatial/New Palace Period (c. 1750 — c. 1500); Postpalatial (c. 1500 — c. 1100 BCE) [24].

For the years of excavation, thousands of square meters of wonderful palaces were dug out: complex corridor systems, rooms with beautiful paintings, light wells, storerooms, water supply and sewerage systems, bath rooms, etc. For quite a long time, Minoan civilization had been labeled as peaceful making reference to Minoan Thalassocracy, "Pax Minoica", and a rather small number of fortifications [1]. Later, the conception of peaceful Minoans was re-evaluated [2; 17; 23]. Nevertheless, the palaces are not associated with fortresses. On the contrary, there are palaces of opulence and splendor surrounded by the mountains, olive groves, amazing flowering of the plains, warm velvety sea. All this beauty influenced ancient Minoans' lives and shaped their culture and art.

Key points and ideas for the exploration of the re-discovered in the 20th century Minoan culture were developed by A. Evans, H. Boyd, F. Halbherr, M. Ventris, J.C. Poursat, D.G. Howarth, N. Platon, S. Marinatos, and many others. The Minoan art was studies by F. Matz, H. Th. Bossert. Contemporary research into DNA from teeth taken from Bronze Age Cretan skeletons showed that ancient Cretans — representatives of the Minoan civilization — had the principal relationships to "Neolithic, ancient and modern European populations" [16]. In recent years, new findings, which can shed some light on this mysterious civilization, have been made by G. Rethemiotakis, M. Tsipopoulou, M. Prent. Some explorers even try to introduce the concept of the Minoan Great Goddess into the domain of gender studies and psychology [3; 5; 6]. However still now, there are more questions than answers. History, culture and art of the Minoan civilization are to be studied in the frame of transdisciplinary paradigm.

The purpose of the study. This paper attempts to analyze the phenomenon of the Minoan art of Bronze Age Crete**.**

The research methodology. Exploratory research design was used to conduct this study. The author has used the hermeneutic approach, comparative-historical and cultural-historical methods, as well as anthropological integrative approach.

The Minoan Art: Joyful Admiration for the World

Usually, our knowledge of history, society, culture is based on the written sources. However, the Minoan texts are extremely few. Thus, the Minoan culture looks like a book with colorful illustrations, but without text. Indeed, Knossos palace wall murals can be compared to movies without sound — religious processions are moving towards the Goddess, ships are sailing, acrobats are risking their lives playing with a bull, beautiful ladies are watching something interesting, but unfortunately we cannot understand what they are talking about. The lack of written information has given vent to researchers' fantasy and the idea of the Minoan culture as the Golden Age of humanity was not accidental. This is an art where everything is joyful, serene and simple without hesitation, doubt and dream; where life is a continuous flow of beauty, an endless game, in which fleeting emotions and joy become the spring of happiness [19].

Everything in the palace of Knossos (the biggest one, 22.000 sq. meters and 1.400 rooms) speaks about the desire to make daily life as comfortable and pleasant as possible — it is light and cool here even on the hottest days. It was achieved by replacing the windows with the light wells. The fragile and decorative form of columns tapering downwards is the feature of Cretan architecture. There is nothing bulky, overwhelming. The art of Minoan Crete is atectonic, weightless. Palaces have picturesque composition, different levels are combined into the whole palace complex — seems architectures try to avoid any regular plan. Light wells and stairs, porticos and galleries, balconies and terraces all together create the effect of surprise, the contrast of light and shadow, spatial dynamics. The palaces were oriented towards sacred mountains, "many of them having an important peak sanctuary on top of them, or, in the case of Phaistos, a sacred cave" [21]. The palaces and mountain sanctuaries can be seen as two parts of one unified system.

Minoan art emphasizes frontal, profile, and overhead views. Sometimes frontal and profile views are combined. Distant objects are sometimes shown slightly smaller [14]. Human life is balancing between the upper and lower worlds embracing both of them. One of the most famous frescoes is the Bull-Leaping Fresco from Knossos (little after 1550 BCE), which is restored of several stucco panels.

The Bull-Leaping Fresco. The Palace of Knossos, Heraklion, Crete
(Author's photo archive)

We see a huge frantically energetic bull whose deliberately elongated figure fills almost the entire fresco. In front of him, behind him and on him, there are slender but strong acrobats playing the deathly dangerous game with the furious animal. The artist marked both the upper and lower boundaries of the world, the bull rushes in the "undefined" world space [19]. The space "overturns on" the viewer; the horizon line goes beyond the fresco. This composition is so vivid and lightweight, that we perceive it as an easy and pleasant fleeting vision. Despite the danger, the artist showed the elegant game. Games with a bull apparently had magical overtones and were related to religious beliefs and ceremonies. This fresco has created debates among researchers over the identities of the human figures regarding their color of the skin. Evans introduced the hypothesis that white (or lighter) skin indicated females, while red (or darker) skin — males. Wolfe proposes the other possibility to interpret

the different body colors, that is, as "a temporal sequence of steps in the representation of the individual carrying out the leap... it is possible that this is the action of only one figure, one of extreme athletic capabilities, which can be seen with his realistic musculature; and of high social rank, because of the elaborate hairstyle, which is adorned with ribbons and other decoration. Regardless, there are many possibilities for the identity of the leaping figure, but they all represent the ceremonial action of bull-leaping and its importance within Minoan culture" [26].

Nevertheless, sticking to the traditional interpretation of white figures as females and dark as males, we can mention that Minoan women took part even in these risky, dangerous "corridas" alongside men. In general, it seems that women were the center of the Minoan world. It can be said that the entire Minoan culture bears the stamp of femininity — typically female tastes and inclinations. Sculptors and artists preferred miniature forms, small details; used smooth, wavy lines; avoided sharply outlined, angular figures and objects; liked bright colors in wall and vase paintings. Men in the Minoan art are as good-looking as women; they can sometimes be distinguished by their color only.

The Minoan paintings are perhaps the most complete and wonderful expression of the Minoan artistic ideal. Comparing to the art of Egypt and Mesopotamia, these paintings reveal a completely new, exciting world. Neopalatial Knossos fresco the "Ladies in Blue" (c. 1650 — c. 1550 BCE) depicts three white-skinned beautiful women with narrow waists, long necks, bare breasts; they are adorned with sophisticated necklaces, bracelets, hear decorations. Perhaps, they are court ladies or even priestesses: they are dressed the same fashion as the Minoan goddesses/priestesses with snakes, whose figurines were found in the Palace of Knossos. But regardless of who they are, these women who personify the moment in its fullness and beauty are so exciting today.

The Ladies in Blue Fresco. The Palace of Knossos, Heraklion, Crete
(Author's photo archive)

A fragment of a wall painting shows the profile of a young girl. A big frontal eye is depicted the same way as eyes in Egyptian paintings. But the spirit of the painting is completely different. This image with a lively face,

cherry mouth, playful dark curls does not seem to be so ancient coming from the darkness of the centuries. The sacral knot worn at the back of her neck may indicate that this lady is a priestess or even a goddess. The painting is lively and vibrant and at the same time accurate and laconic. It expresses inspiration and naturalism of the Minoan art. It is clear why Evans immediately called the girl "La Parisienne" as she was thought to epitomize feminine beauty and elegance of that time. This figure belongs to a larger composition the "Camp Stool Fresco" (c. 1450 — c. 1300 BCE) that shows standing and seated figures on camp stools raising cup and kylikes.

La Parisienne Fresco. The Heraklion Archeological Museum, Crete
Author's photo archive

It is no accident that the Minoan artists paid much attention to the women's world. Dating back to Evans and his discoveries [10], it was believed that Minoan women had occupied a privileged place in the Minoan society: the Minoan "center of gravity" was shifted towards women. The amazing images of the court ladies found in the Palace of Knossos got researchers thinking about it. It is difficult to find any close analogies both in the ancient Eastern art and the art of classical Greece. Minoan women seem to be free in their actions and desires — they are depicted without men or in the foreground of a picture.

Minoan preeminent deity was the Mother Goddess/Great Goddess who embodied fertility, birthing, nursing, power, protection; who mediated between life, death and rebirth, the known and unknown; who had power over the natural world [6]. It seems that Minoan Crete was a Goddess-centered and women-centered society. Thus, women in the Minoan art are given great respect, "women were important, perhaps because they had some kind of privileged access to the mysteries of nature and the spirit world" [15, p. 54].

The "Prince of the Lilies" Fresco (c. 1550 BCE) is a famous ancient Minoan fresco, which was found in fragments and restored according to an artist's vision. A young handsome man is depicted against the red background. He is wearing a crown adorned with lilies; hence, the other name of the fresco is the "Priest-King". His stance indicates that he is pulling something or someone with his left hand. However, his left arm was missing and the interpretation of his gesture is unknown. This young man is refined and elegant, but he is not weak — his well developed muscles, excellent posture and calm self-confidence indicate he could participate in bull-leaping. In general, people in the Minoan art are beautiful. Perhaps, for a Minoan artist there was nothing more admirable than beauty in all its forms.

The "Prince of the Lilies" Fresco. The Palace of Knossos, Heraklion, Crete
Author's photo archive

Observing the Minoan Art through the Lens of the 21st Century

The Minoan artists lived in the very moment, and this moment brought charm and beauty into their creativity. The Minoan art deified the natural world. Humans, flowers, birds, bees, dolphins, octopuses, corals, starfishes are equal inhabitants of the Minoan masterpieces — frescoes, magnificent vases, glyptics, jewellery. The sea was dominant for Minoans, thus, many motifs were borrowed from the sea depths. We clearly feel the love of the artists for the sea, for the eternal movement that reigns in it. The endless blue sky, deep green-blue-purple sea, blossoming groves "gave" their bright colors to the Minoan artists. The Minoans enriched the world art with fluidity and movement as the basis of the artistic image; with the wavy patterns; with the desire to capture

the very moment. In many ways it is close to the artistic vision of a modern human.

The Minoan artworks available to us today are to a large extent the restorations, reconstructions, and artistic variations. Even the Minoan world, according to some researchers, was invented by Evans [13]. Archeological excavations in the second half of the 20th century challenged the very idea of the peaceful Minoans and the Golden Age of humanity: "Soon after the 1960s, when the Minoans had been conscripted into the popular imagination as a prehistoric version of hippie culture (lilies pointing to the ancient equivalent of flower power), the archaeological mood changed. Some controversial discoveries close to Knossos of children's bones (carrying suspicious marks of butchery) raised the nasty possibility that the peace-loving Minoans had actually been human sacrificers. New research projects in the 1970s and 1980s focused on the networks of roads and fortifications with which the prehistoric elite of the palace of Knossos had strictly controlled their home territory — while scholarly attention also turned to the high-quality state-of-the-art weaponry that had generally been ignored in favor of Evans's "lustral areas", "bull dancers", "saffron gatherers", and lilies. So much for the pax Minoica" [4].

Evans's reconstructions were subjected to serious criticism from the standpoint of contemporary archeology. However, we can "throw out the baby with the bath water". We do not have to accept everything he stated about the Minoans, but we should be grateful for his profound inquiry into the unknown world of the human past. Furthermore, as Nietzsche emphasized, there are no facts, only interpretations. And human history is a long chain of more or less successful interpretations that may vanish in the daylight of the new truth [8].

The Minoan art is important for contemporary humans because it draws attention to a harmonious life in the world of here and now; it carries an incredible power of inspiration and beauty. Humans, animals, fish, birds, flowers in their harmonious interaction act as a central point of the artistic space — they make us dream of the Golden Age of humanity. Probably under the influence of the Minoan art, I. Yefremov wrote his magnificent novel "Thais of Athens". Numerous images of beautiful women in the dominant positions of the Great Goddess led to the idea of the Cretan matriarchy (or Cretan matrilineal society) and inspired scientists to undertake new research in the domain of gender and feminist studies. For example, a feminist historian and theologian C. Christ made the Goddess movement a recognizable international cultural movement.

Conclusions

The Minoan art reflects a joyful and slightly childish perception of life. The Minoan paintings with bright colors seem to be a hymn of earthly joy and beauty that brings comfort and reconciliation with reality [9]. As I. Yefremov described it, "The impossibly beautiful Cretan art never portrayed military heroics. Images of victorious kings, tortured victims, tied and humiliated prisoners of war were absent from these palaces and temples. Instead, the art was of nature: animals, flowers, sea waves, trees, and people walking among them, primarily women. Ritual sacrifices and bull games, strange animals never seen either in Hellas or on the shores of Finikia were all portrayed in these frescoes.

The sophistication of their taste and perception of beauty amazed Helenians, who considered themselves to be above all people in the Ecumene. The delicate paintings were full of joy, light and purity of color. There were statues of women, animals and domestic pets, amazing seashells made of ceramic, but no mighty heroes, swinging swords or raising heavy shields and spears. Where else in the world was there a country that dedicated all of its art to the harmonious connection between people and nature, and above all to women?" [27, p. 17].

Hardly ever in the history of humankind there was a society that did not know wars, conflicts, suffering, and pain. And the Minoan world was not an exception. But the Minoan art has the power to bring a feeling of lightness, joy and a happy flight of a soul into our lives, to "develop the experience necessary for the evolution of the Universe — the discovery of a new beauty" [18, p. 93]. And that really matters.

Acknowledgments

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Pedological ideas of Stefan Baley and ways of practical implementation of them into the Ukrainian educational process

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Abstract. The article presents the general information about pedology development in the world and in the Eastern Europe as well. In this context, pedological ideas of the famous researcher, pedologist, psychologist Stefan Baley are presented. The article gives brief information about biography of the scientist and his conceptual ideas of pedology and educational psychology. The explanation of the term pedology according to Stefan Baley is given in the article as well as his researches of the physiological and psychological development of a child. The article present the famous table of age child psyche development compiled by the scientist. The article presents the research, conducted by S. Baley concerning the educational influence on children by different kinds of surrounding things, such as: book, film, animals, plants, radio etc. The educational role of family is mentioned in the article as well as the influence of a child origin on the psychological development and educational process is presented in the article.

One of the main idea of the article is to propose ways and methods of the usage of Stefan Baleys' pedological ideas in the modern educational process. His ideas can be used mainly in schools, since he emphasized a lot on the educational processes in this institution. His ideas can solve different modern problems which faces modern society. For example, existence of so called "death groups" in Ukraine which affected children and teenagers between 12 to 17 y.o. They were spread through social networks, such as Vkontakte and their aim was to bring to suicide children and they should film the process. The article propose to use Stefan Baleys' ideas in the educational process in school, since he did a lot of researches concerning methodology of syllabus compilation, attention of pupils, tiredness, methods of evaluation, teacher's behavior, processes of a child socialization. The article presents his great idea concerning introducing psychologists in schools and increasing their role in child's education and learning as well as teaching them.

Pedology — is a science, founded by the American psychologist and teacher G. Stanley Hall (1846-1924). Its aim is to unite such approaches as psychology, pedagogy, medicine and biology towards the study of a child. Thus, pedology — is a compound science that study not only psychological aspect of a child's development, but also physical or physiological.

The term pedology was introduced by the famous American psychologist, student of G. Stanley Hall, Oscar Chrisman in 1883. The first pedological works began to appear in the end of the 19th century, written by G. S. Hall,

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W. T. Preyer, E. Meumann, J. M. Baldwin etc. The term Pedology consists of two Greek words: pedos — child and logos — science. The central object of research of the pedology is a child, its physical, psychological and intellectual development, socialization of a child, child's hygiene and health, and all things and elements that influence the development of a child.

Pedology spread all over the world, starting from the US, then went to Europe, in particular it was researched in England, France and Germany. Its representative include such scientists as: W. T. Preyer, E. Meumann, W. A. Lay, W. L. Stern, A. Binet, T. Simon, J. Sully and others.

In Ukraine pedology appeared in the end of the 19th century. The most famous pedologists in Ukraine were Ia. Chepiga, V. Protopov, O. Zaluzhnyi, S. Ananiin, O. Popov, I. Sokoliankyi and others. In 1878 Ukrainian psychologists and pedagogue I. Sikorskyi founded in Kyiv Doctor-Pedagogical Institute the main task of which was the experimental research of a child. Ia. Chepiga introduced the researches and scientific works of S. G. Hall and W. Lay in Ukraine, emphasized on the complex research of a child. Ia. Chepiga was the founder of the Pedological Institute in Kyiv as well. O. Popov — is a lecturer on Pedology and the author of numerous pedological works.

After 1936, when pedology was banned in the Soviet Union by the special degree of Org Bureau of Central Committee of the Communist Party "About the pedological distortion in the system of Narkomos", from 04.07.1936. Since 1936, many prominent pedologists were made to emigrate or were imprisoned and repressed. Pedology was assigned as a pseudo-science that harms the Soviet Educational System. Teaching of the Pedology was forbidden in all educational institutions. Thus, the Pedology was killed at that time, both, in Ukraine and in Soviet Union [5].

Pedological movement has touched Stefan Baley, prominent Ukrainian and Polish scientist, pedagogue, psychologist and philosopher. He was born in Ukraine in 1885. Professor S. Baley studied in the Lviv University. He was a student of the famous polish philosopher K. Twardowski and under his scientific supervision presented doctoral thesis on psychology. Stefan Baley studied not only philosophy and psychology, but also medicine in Lviv. Having graduated Faculty of Medicine, he began working in hospital. After obtaining the grant for study abroad from the Austro-Hungarian government, he went abroad to France, Germany and Austria to study there. He moved to Warsaw in 1928 and became a head of the department of Educational Psychology at Warsaw University. Stefan Baley is considered as one of the founders of the pedagogical psychology in Poland. He was head and members on numerous Polish scientific circles and Polish Academy of Sciences as well. He died in 1952.

Stefan Baley left a great scientific heritage, written in many languages, which included: books, manuals, articles, recommendations etc. The most important among them are: "Osobowosc" (1939), "Zarys psychologji w związku z rozwojem psychiki dziecka" (1935), "Psychologia wychowawcza w zarysie" (1938), "Wprowadzenie do psychologii wspołcznej" (1959), "Über den Zusammenklang einer größeren Zahl wenig verschiedener Töne" (1915), "Versuche über den dichotischen Zusammenhang wenig verschiedener Töne" (1915), "Фільософія Ляйбнїца", "Нарис психольогії" (1922), "Нарис логіки" (1923), "З психології творчості Шевченка" (1916) etc.

Stefan Baley approaches the study of a child comprehensively, from a pedological point of view, since he researched not only psychological development of a child, but also physical. He researched different forms of influence of social groups and pedagogical institutions on the development of a child as a whole. Pedological concept of Stefan Baley consists of physical, social and psychological development of a child.

Child and childhood become one of the main object of scientific research and works of Stefan Baley. He used such sciences as: pedagogics, psychology, sociology, philosophy while researching child and elements of its development. The scientist tried to research child comprehensively, its mental abilities, psyche, analyze methods of educational influences on a child for normal and appropriate development. In his researches and publication author researched child's psyche in general, elements and features of its development and also such important elements of child's psyche as: temperament, character, morality, child's lies, communication with other children, processes of socialization etc. Stefan Baley tried to analyze behavior of a child in different situations and environments and provide methods of effective influence on it with the aim of education. Not only did he use publications and researches, but also he did his own researches, for example, author very often used Stanford-Binet intelligence scale to determine the level of intellectual development of a child.

The publication of Stefan Baley contain the description of main psychological and physiological stages of child's development on a certain age. He used age aspect in his researches of child's development, for example, he compared volume and weight of a heart of small child and adult and provided the quantity of its increasing. The same way he described and researched other phenomena of child's physiological development. One of the most important scientific statements of Stefan Baley is that psychological development of a child is closely interconnected with physiological and thus, they can influence on each other. Owing to this, Stefan Baley, while researching psychological development of a child, paid great attention to its physiological development, which he divided into the following types: development of body, physiological changes, development of movement of a child. He researched the development of speech, hearing, sight and smell in a child as well.

Psychological aspect consists of different and numerous researches of the author concerning psychological development of a child. Great importance has a table, compiled by Stefan Baley, with the division of children's life into age and describing peculiar psychological features that occur in a child's psyche, during certain periods of life. The scientist described characteristic features of child's psyche, starting from the child's birth and ending with the age of 24 years old. Stefan Baley provides the detailed description of every age period, gives them names and describes peculiar features that can be observed [3, 318-333]. He conducted researches not only in the age psychology, but also in the development and notion of child's character, temperament, intellect, sense of will, behavior etc. More detailed S. Baley described the development of psyche in children of the period of maturation, which he published book on: "Psychology of maturation age" (1932).

Stefan Baley paid great attention to researches of social element in a child's development and education. He investigated influence on a child's de-

velopment and education such kinds social institutions as: family, school class, society, social groups, origin of children etc. His ideas can be used by modern social institutions in the process of child's development and education.

The first and the most important social institution in the child's life is a family. It plays the crucial role in the educational process of a child. While analyzing the family structure, professor Stefan Baley focused on the forms of the educational influence on a child in the both, families with one and more children. The biggest influence on a child, according to the scientist, has its mother. Such influence can be educational and teaching character, since many parents teach their children how to walk, sit, eat etc. [4, 482]. Parents have great educational influence on a child, since they create some rules of behavior for children which their child should obey and stick to them. Stefan Baley noted, that small children see in their parents persons that are stronger and cleverer than they are and try to follow their parents. Sometimes they can identify their parents as God, that protects and teaches them [4, 486]. This information can be of great use for parents, since they can educate children through the example of their own behavior. Parents can focus on some features of character of a child, which they want to be present in their child, and try to develop it, using information that kid tries to follow behavior of his/her parents.

The important factor, that influence the child's development, is the number of children in a family. Family, according to Stefan Baley, is a social group, that are guided and ruled by parents, has its own members that influence each other a lot. Children, living in the family with one or more brothers can develop social abilities faster than ones, that are unique child in a family. This information is important, because the presence of more than one child in a family will facilitate the socialization processes of a child. Of great importance is not only the number of children in a family, but also the house, state of its cleanness or tidiness, origin of families and their welfare and social position. Children from rich families, according with the researches of Stefan Baley, has more developed intelligence and poorer children are more developed physically [1, 42]. The same way is with children of city and countryside origin. Children from cities are more developed in the intellectual sphere, while children from countryside — in physical [4, 291].

Family, according to Stefan Baley, is ideal social unit, every member of which consecrate himself to other member. Thus, parents, as organizers of a family, should take into account this notion of the researcher. Parents also should take into account sincerity and kindness of parental influence on children, since Stefan Baley stated that parents who treat and educate children with sincerity and kindness have greater influence on psyche development of a child than trained educational specialists, teachers or school. Parents should also not be afraid when a child starts to become more distant from them. According to Stefan Baley this distancing take part when child is in the period of maturation, between 13 and 20 years old. This period, according to researches of the scientist, is characterized by opposition of a child towards adults opinion as well and thus, parents should take into account this information.

Stefan Baley highlighted the importance of the social environment, in which a child lives, on its development. In this case, the scientist divided

society into several elements and described in detail their role and influence on the educational process. One of the important elements in the child's education and development is social group. The important feature of such group is the presence of a leader and the very group should be united and collected [3, 420]. Professor Stefan Baley provides the peculiar features of a group, while distinguishing and comparing it with the crowd of people. He introduces the notion of "group soul", like the "class soul", has peculiar features, such as: common traditions, pronunciation, nicknames, norms of behavior that exist only in that group and are known only to its members [3, 422]. Stefan Baley listed the major psyche elements, which a group can influence, they are: sense of will, believes, formation of thoughts and intellectual sphere. The important fact is that work in group, according to Stefan Baley, is done mainly better than the work done by its members alone [3, 427]. Thus, this information, provided by researches of Stefan Baley, can be used in schools, since the educational process take place in groups.

Of great interest is the research, conducted by Stefan Baley concerning the educational influence on children by different kinds of things e.g. geographical, technical, biological etc. Professor Stefan Baley emphasized the importance of surrounding that is around a child on his/her educational process and development. Thus, the scientists includes a book, film, radio to the cultural environment that has some influence on the child's psyche development. The peculiar educational influence on a child, according to Stefan Baley, has a book, since it is very important mean of spreading and transferring culture [3, 462]. Concerning a film, Stefan Baley researched and described mainly the importance of documentaries and scientific films on the child's development. Practical implementation of films lies in the visual example of teaching material, concretization and facilitation of the educational process and understanding and this can have positive effect in the modern education. Childrens' toys professor Stefan Baley divides according to the child's age. The important influence on the child's psyche development has flora and fauna, in particular — pets. A child treat home pets as equal to himself/herself and is very interested in them and tries to make contact with them. However, a child can be afraid of pets. Child began to show interest to plant on the later stages of its development [3, 471-472].

The important and interesting is the research of Stefan Baley in the sphere of psychology of self-education. The notion of self-education he explained as follows: "...it is a case, when educator and fosterling, object and subject of education process is the same person." [3, 456]. Person can do self-education only after dividing its personality into small pieces and compare them with the same pieces of a personality of his/her ideal person. Self-education is a conscious process of improving person's own personality to the standards of his/her ideal personality. The process of self-education cannot happen in a small child. However, in young people, according to Stefan Baley, there are some tendencies to self-improvement and self-education [3, 457]. Thus, this information can be used by teachers and parents who can try to set or present good and positive ideal personalities for children to follow. This will result in acquiring positive features of character in children.

School and school class is one of the most important socio-educational institution that has great influence on a child. Child spend so much time in school that it can have great influence on it educational process. While researching educational influence of school, Stefan Baley noted that the normal age for children to go to school is 6-7 years old. This is the time, when the intellect of a child is mature for learning. This is the age when child should be able to keep to the schools' rules or teacher, should be able to concentrate attention and keep to the demands of systematic study [3, 369].

While researching the importance of study in school, Sefan Baley describes and analyses such notions as the state of activity and interest of a pupil during a lesson. Scientist stated on the importance that any child should be able to use obtained knowledge on practice, in real life [3, 509]. Since a child is learning in a group, which is school class, it is important to conduct such activities, participant of which will be all group, not some single pupils. This information has peculiar importance in Ukraine, because very often teachers do not make pupils with poor knowledge participate in the learning process. Teachers often leave such children alone and do not touch them and the reason is not to waste time for them. Such kinds of thoughts are mistaken and can have negative effect on child's education in class. Therefore, modern teachers should take into account this idea of Stefan Baley about planning lesson and using such kinds of teaching methods for each pupil to obtain equal attention of teacher and knowledge from lesson.

Interesting and useful is information about the tiredness of pupils in school, which was researched and described by Stefan Baley. Tiredness comes after continuous physical or mental work, performed by a person. Thus, tiredness can be physical and psychological or intellectual [3, 571]. Tiredness can be observed on certain changes in the behavior of children and some physiological features, such as: change in blood circulation, change in respiration etc. [3, 575]. Tiredness, according to Stefan Baley, negatively influence a child by decreasing the level of attention or will to work or study, low level of brain activity etc. All these features makes the process of learning and education more difficult. Therefore, the scientist propose to change activities, i.e. learning and then some physical activities. Teachers can use modern technologies, for example, computers or wall projectors to show children some interesting and developing movie about the subject. This interchange will facilitate education and make it easier for children to understand.

One of the main elements of the educational and learning processes in a school is a school class. Stefan Baley singled out and presented some peculiar features that any class should have, for example: school rules and norms, subordination to one teacher or class monitor and the unity of all pupils in a class [3, 590]. The process of class formation is long and need a lot of efforts. Class in forming, usually after all the children get to know each other or after passing over some common life moments. Class is one of the form of a society in which children live and learn. Teacher plays great importance in class formation. According to Stefan Baley, any teacher should know its pupils very well, so the professor emphasized on the detailed observation and examination of the teacher of its pupils. Any teacher should conduct psychological ward on pupils and evaluate their work correctly. This is very important factor, since pupils

evaluate the very process of evaluation and often compare his or her mark for the same work with the marks of other pupils in the class and sometimes it can have negative results. Psychological ward on pupils has great importance and it should be done together with school psychologist. While evaluating pupils' works, teacher should take into account such principles: sources of a mark, to what relates mark and formulation of mark [3, 651]. Evaluation, according to Stefan Baley, can be done not only by marks or numbers, but also by different kind of promotions or compliments or punishments or restrictions. Teacher should take care of the educational process in school and rise the interest to study in children. He or she should closely cooperate with school psychologist with the aim to better knowledge about pupils, their interests, hobbies, experiences and emotions to simplify and better the educational and study process [3, 649].

Professor Stefan Baley did a number of researches concerning school educational programs, which resulted in a couple of methodical recommendations about the process of educational programs composing. These practical recommendations can be useful for teachers and school psychologists in modern schools, though they were mentioned by Stefan Baley more than 70 years ago.

The first such recommendation is that the process of school educational program composing should take part together with the work of school psychologists. Their task, according to Stefan Baley, lies in the selection and ordering of material proposed by teachers. In case a psychologists does not take part in school educational program composing, he should analyze ready program and evaluate it using his knowledge in human psychology. Psychologist, on the basis of his knowledge about child's psyche periodization and its development, can advise teacher in the process of material selection for pupils. He can tell whether given material will be interesting for pupils and will rise the motivation in them thus, resulting in more effective learning and comprehension. This information and recommendations can be of particular use for Ukrainian teachers, because psychologist in a school does not take active part in the process of educational program compilation.

School psychologists, according to Stefan Baley, can do some evaluation and tell warnings about proposed methods of teaching and educational material presentation. The role of psychologists rise when teacher wants his school educational program to not only give pupils knowledge and skills, but also educate them and prepare them to live in a society. In this case a school educational program should be planned in such a way that all psychological needs will be taken into account appropriately and in time, while harmonically combine with the methods of teaching. This proposal will allow modern schools and teachers not only give children some knowledge, but also will teach them how to behave in society.

The other recommendation of the scientists is the principle of social usefulness. This principle is very important to be included in modern educational school program, since it presupposes that the program should contain such material that will be useful for pupils as future member of society. This material can include skills of communicating with people and in particular with elderly, rules of behavior in different situations, which can occur in society. It is important to mention that Stefan Baley was against the fact that useless

information and materials were included in school educational programs. He understands such material and information as those, which will not be used by pupils in the future. This is of particular importance since a number of useless material is learned by pupils and they forget it in a couple of years. Thus, valuable educational time, which is wasted, could be used for some other kinds of educational activities or useful information.

Stefan Baley mentioned that while composing school educational program one should take into consideration interests of pupils and the principle of comprehensive development of pupil's personality. These principles is of particular use, since interests of pupils can rise their motivation in study and thus it will result in more effective learning process. The scientists said that the school educational program should contain several subjects, the aim of which is to develop and improve the level of mind, rise intellectual level and develop psychological functions.

One of the most important scientific researches of Stefan Baley concerns the division of child's psyche development for periods and phases and detailed characteristics of each of them. The division of children was done starting from the period of infant and ending with the period of 24th years old. This table can be useful for teachers and school psychologists. They can use this table while developing and composing the educational school plan, choosing materials for teaching, choosing and elaborating methods of education, rising the interest and motivation in children to learning new material etc. For example, the table provides information that children of 13-14 years old like stories in which a main character is surviving in the wild nature, like Robinson Crusoe, so knowing this information, teachers can select such kind of materials that will be interesting for pupils of this age and accordingly this will rise not only interest of pupils in the process of learning, but also motivation. School psychologists can have a lot of benefits using this table, because it can help them to understand better pupils needs, interests, feelings and behavior and thus can improve their educational influence on pupils.

Stefan Baley researched the notion of psychodidactics in schools. The results of this research can help a teacher to improve the methods of teaching that is actual in the modern system of education. Psychodidactics, as a subject, according to the words of Stefan Baley, combines didactics and psychological components in order to improve the process of education and learning. The researcher divides the subject into two main parts: psychodidactics of arithmetic and psychodidactics of reading and writing. He provides interesting and useful methods of teaching, which can be of great use for teacher, mainly to rise their motivation and interest.

Of great interest is the research of Stefan Baley concerning childrens' games and creativity. While comparing child's games with work of adults, the scientists noted that a child treat games with great responsibility as well as adults treat their work. Games promote creativity and work, give the possibility to understand these notions [4, 191]. Therefore, parents and teachers should not forbid children to play, because playing will increase their responsibility and develop child comprehensively. Games go through some stages of evolution or development as well, said Stefan Baley. The lowest games are functional that include different kinds of movements, running, jumping, talking etc. Higher

stage are manipulation games when a child begins to treat some objects as a material and other as an instrument. The next stage are constructional games — when a child begins to construct different objects with using other objects and the results of such kind of games is some creation [4, 191-192]. A child is often satisfied with the result of their work, observe it and waits for compliments from adults and here is important to give such compliments for children. This statement is very important for modern parents and teachers in order to rise child's motivation, interest and self-confidence. Parents can also inform themselves about the division of childs' games according to age and choose those that correspond their kid.

The research of Stefan Baley concerning work of school psychologist and conducting psychological ward of pupils is extremely important element in the modern society. On the basis of numerous researches and work done, he gives a number of proposal concerning the work of school psychologists and teachers. The firs proposal is about the fact, that teachers and school psychologists should observe children not only in class during lessons, but also during breaks, while children are playing. This, according to the scientist, will give the information about pupils interests and their behavior, so teacher and psychologist can choose appropriate teaching methods and materials. The second proposal was concerning the psychological ward of pupils in school. Stefan Baley said, that it is important to create so-called psychological profile of pupil's personality, when a kid enters school, and write changes that occur with these pupils during his stay in school. Using such profiles and psychological ward psychologists can spot some negative changes in pupils' personality and can do some actions to prevent it. The bright example can be spotted in Ukraine and Russia. A couple of months ago there was a big problem concerning so called "Death groups", which existed in social network VK. Their task was to write messages of certain context, in order to provoke or even force a child to some action, like doing harm to himself. The final stage of such actions was always suicide of a child, which he should film of the camera online. If school system of Ukraine and Russia had had well developed psychological ward and psychological profiles, such problems would have been avoided. Psychologists would react immediately when they saw some changes in the behavior of children and many childs' suicides could have been avoided. Thus, it can be noted that ideas of Stefan Baley concerning psychological ward in school and creation of psychological profiles is very important in the modern system of education.

The important ideas of Stefan Baley that can be used in the development of modern school and educational system concerns the creation of special classes for children with intellectual disability and for children with difficult character. The researcher proposed to create such classes in schools and send there kids that do not have appropriate mental of intellectual level to study in class. Such classes or even schools should have trained specialist, teachers and psychologists. The educational and learning process there should be conducted according to specially developed programs, syllabus and methodic. He proposed to create special classes for children who is not able to study or for those who learn with difficulty. However, Stefan Baley noted that gathering such kinds of children in one class and left them without any "good example" i.e. pupils with normal of high intellect, can have quite negative effects. Arrogant

attitude to such children is possible in school from other children. Thus, it can be noted that Stefan Baley tried to research benefits of inclusive education in the early 20th century. The ideas of Stefan Baley concerning inclusive education can be adapted to modern school system and methodology of education and teaching.

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Зміст

CONTENTS

Тематика та мета журналу

«Міждисциприлінарні 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 висхідному форматі. Журнал друкується чорно-білим, проте у електронній версії матеріали будуть відображені у кольорі.

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Aims and Scope

"Interdisciplinary Studies of Complex Systems" is a peer-reviewed open-access journal, which publishes research articles, reviews, letters, discussions, historical and philosophical studies in all areas of the complex systems theory in order to provide the interaction between scientists working in different areas of Mathematics, Physics, Biology, Chemistry, Computer Science, Sociology, Economics etc. We would like to promote the significant source of up-to-date information on complex systems worldwide. The journal shall be a part of the scientific forum, open and interesting for experts from several areas and for a broad audience from students to senior researchers. The journal shall give a possibility for scientists from different disciplines to present new ideas, conjectures and pioneering developments. The research papers and (but not only) reviews are especially encouraged. At the same time, papers in the history and philosophy of science, information about scientific events, discussion papers will welcome.

To authors

The journal publishes original articles, reviews, information on English, Ukrainian, Russian, and German. Russian and Ukrainian articles should contain English translations of a title, an abstract and authors' names.

The submitted articles should be in an electronic form only. Files should be prepared in LaTeX or in a text-processor program like Microsoft Word, Open Office Writer etc.). Other formats of files might be accepted by the previous agreements with editors only. Pictures should have the high quality, graphs and diagrams which are prepared in external programs must be submitted separately in the original format. The journal is published 'black-and-white' however the electronic version will represent the full color of all materials.

Articles, questions, and advice should be submitted to the editorial office through the registration at the web-site **http://iscs-journal.npu.edu.ua**

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1) Автори застосовували статистичні методи та робили висновки за нерепрезентативними вибірками.

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