

CHAPTER «HISTORY OF ART»

INTEGRATION OF ART EDUCATION IN UKRAINE AND EUROPE IN THE LATE XXTH TO EARLY XXIST CENTURY (BY WAY OF EXAMPLE OF ARTISTIC METALWORKING)

Illia Popyuk¹

DOI: <https://doi.org/10.30525/978-9934-588-38-9-49>

Abstract. The article deals with showing the stages and processes of filling, with the richness of content, the interchange of educational and cultural, integration relations between art educational establishments in Ukraine itself and the European space in the field of artistic metalworking of the specified period. It considers conditions of formation of mutual influences and relations with the European art environment and educational institutions. Revealed are also trends of the gradual development of Ukrainian art educational institutions in training metal art specialists. On their example traced are basic conceptual principles, common and distinctive features, teaching methods, forms of training specialists' skills, peculiarities of teaching special disciplines on metalworking in various countries of the Soviet and post-Soviet period, as well as art *schools* of European countries. It is separately ascertained that most industrial factories, works, private cooperatives, firms, workshops of both the former Soviet Union, particularly the Artistic Fund of the USSR (decorative-and-applied and monumental departments), and in independent Ukraine (for the production of artistic and souvenir goods) carried on a useful *policy*, namely forwarded their employees for probation, training in secondary special schools (specialized schools, technical schools, and colleges), higher educational establishments (institutes, academies, and universities). Those institutions, which did it, included jeweller's, forging-and-welding, foundry, swaging-and-stamping, tinsmith's, and

¹ Senior Lecturer at Studio Pottery, Wood, Sculpture, and Metal Department, Mykhaylo Boychuk Kyiv State Academy of Decorative and Applied Arts and Design, Ukraine

enamelling shops. The article examines the interconnection between the educational process, the teaching of special disciplines and the interdisciplinary complex communication of professional disciplines (drawing, sculpture, painting, anatomy, art history, etc.). An indisputable phenomenon in the research is lasting traditions of cooperation: between a pupil, student, postgraduate student and his/her teacher, supervisor (instructor) of a yearly project, graduate work during the lessons of the educational process. The article observes requirements of modern production coupled with educational conditions of an art institution, the preparation of informativity formation aiming at and contributing to the development of intellectual activity of a future specialist of middle and higher levels of production management (shop foreman, industrial designer, and modeller-designer). There is a consideration of conditions of the modern times in formation of art education of artistic metal at Ukrainian educational establishments with obligatory concentration of target attention on high-quality fulfilment of school classes, yearly projects, diploma works, models in various techniques of art metal working in synthesis combination of different materials, peculiarities of environment formation, their merge and connection with visual, as well as decorative and applied arts. An emphasis is placed on designing metal work, characteristic features of their application environment (jewellery, forged consumer goods, tableware, souvenirs, small architectural forms, etc.). The article also covers artistic creativity of leading artists-teachers of Ukrainian educational institutions, as well as their influence on artistic metal *school's* creation at their corresponding departments, sub departments, and faculties. Guidelines are formed for teachers of art educational institutions regarding the formation of positive teaching in centres of pupils and students by means of special-purpose art projects, forums, festivals, and methods of their own expression (informational, research, and practical master classes). Integration processes of art education should result in acquiring an appropriate level of relationships, communicative competences that will allow students and future specialists in the field of art metalworking to freely use their knowledge within their professional activity, to confidently feel in both a multicultural environment and the digital space, and to gain competitive ability at art domestic and international labour markets.

1. Introduction

Novelty of the problem and topicality of scientific solutions in the coverage of this issue. It is indisputable that in the modern post-industrial and digital space, art education (artistic metal) is increasingly influenced and dependent on changes of modern requirements of the educational complex, as well as the specificity of special disciplines' study programmes, modern manufacturing techniques in metalworking, a level of production capabilities, *capacities* of an educational institution, the ability to adapt to new opportunities for implementing tasks and projects in a short period of time.

Accordingly, the novelty of scientific research consists in the fact that concepts of *art school* and *artistic metal* are introduced into the art criticism, which determines the processes of transformation and integration of educational institutions in the preparation of artistic metalworking specialists for the common European and global spaces. In addition, there is an investigation of a large volume of student works (yearly, graduate, and expositional works) at Ukrainian educational establishments, which reveal the regularity of integration processes of art education with the European ones. Considered are also their creative development, works in the sphere of artistic metalworking (blacksmiths, jewellers, enamel workers, foundries, casters, welders, tinsmiths, armourers and others), and a current state of the educational process in the field of mobile integration, exhibition activity on various platforms and grounds.

Analysis of recent studies and publications. This topic and its analysis show us that art education (artistic metalworking) has not become the subject of joint comprehensive study by art critics and culturologists, which has led to the choice of this topic in our publication. So, considering this issue will enable us to examine, from a new perspective and in a wide range, the historical influences of the present, to identify integration peculiarities, their connections with global phenomena and trends, as well as to shed light upon activities of art educational institutions of Ukraine and Europe in their integration between each other in the late XXth to early XXIst Century in the context of artistic metalworking. There is a great need to focus an attention on the fact that recently there appeared a large number of scientific articles in the field of integration processes of pedagogical education into Ukrainian and global sciences. Yet, there is still a small number of articles, scientific papers, and field studies dealing with art education, particularly, artistic metalworking,

which is covered not enough in various scientific collections, professional journals on metalworking. Information on achievements, progress, integration of educational institutions in expository activities of European countries, as well as development and application of pedagogical and engineering techniques in the educational process were examined by O. Navoysa (magazine *Blacksmith's Workshop*); O. Marychevska (magazine *Fine Arts*); art critical researchers O. Fedoruk, L. Pasichnyk, and I. Mishchenko; artists-teachers of Ukrainian educational institutions O. Ivasiuta, O. Bonkovskiy, R. Shmahalo, and O. Kravchenko; S. Polubotko; I. Popyuk, I. Zadorozhnyi, V. Horodetskyi, O. Barbalat, V. Tymchenko, V. Harkus, and others.

Purpose of the research and research objectives. In the system of artistic professional training of artistic metal specialists, new trends drive the changes that take place in the economic and political sphere of countries, in the formation of global information and digital space, determine the *purpose* of the research, which is aimed at analysing the study of this topic. This outline defines the following tasks:

– To *identify* the state of cooperation on this topic in Ukraine and Europe, to analyse sources of inter-university art events, joint projects, open airs, and exhibitions.

– To *define* terminological concepts of *art school*, to elucidate specificity of their applying the methodological principles of teaching.

– To *find out* peculiarities of formation of mutual artistic and cultural exchange, which is conducive to joint integration processes of the specified period.

– To *substantiate* main trends of the art educational development, their orientation and diversity in Ukraine in the late XXth to early XXIst century.

– To *outline* existing tendencies of formation of digital and information space as a new sphere of art educational development in the field of artistic metalworking, particularly, in jewellery, blacksmithing, foundry, stone working, as well as in the field of implementing IT technologies and 3D modelling in educational programmes of Ukrainian and European educational institutions based on analysing scientific works of the art criticism's latest achievements.

Research methodology. The aim of the study was to show peculiarities of solutions in the assigned tasks and to draw attention to the vision of a modern approach to integration processes in the study of artistic metal and its processing at Ukrainian and European educational institutions, which is

determined by the nature of the material collected. The study is based on comprehensive general scientific methods of empirical and theoretical levels being carried out, notably observation, comparison and abstracting, analogy, generalization, systematization, art critical analysis, synthesis, induction, and deduction. In the scientific work, methods are used that summarize the experience of previous studies grounded on archival, bibliographic and field factual materials. Principles of covering the factual material are based on synchronous delineation and coverage of development of integration processes in Ukraine and Europe, as well as on revealing the main artistic trends of artistic metalworking. The method of the art critical analysis and synthesis is applied for identifying artistic features of the artistic metal *school* at an educational institution, its significance for Ukrainian art history and culture.

Terminology. Since the question is about both artistic metalworking and the decorative and applied arts, the text will thereafter use the abbreviations *AMW* and *DAA*.

2. Activities of art educational institutions (AMW) of Ukraine and Europe in the late XXth to early XXIst century

There is no country at all where art does not accompany the country in its activities, meet its spiritual and aesthetic needs, its ideal and purpose. Each of us brings something to the world: the reconsideration of all aspects of society, the formation of a coherent personality, the responsibility and development of integration processes at an educational institution, in the state. In the modern post-industrial world, art education of AMW is becoming increasingly dependent on industrial technologies, the level of manufacturing capabilities, and computerization of modern production. An artist comes to be a part of an infinite cycle, where only stereotypes prevail, so the problem of vocational training of middle- and higher-echelon personnel in the field of art education, the urgency of present artistic ideas and design solutions are extremely required, in particular, in the artistic metalworking, which calls for the understanding of complex historical and social conditions of its development and integration processes in the global art of artistic metal.

It is necessary for us to comprehend the historicity of the situation of the mid- to late XXth century. It was the artistic culture and education, which became, at the time, the sphere within which the national consciousness was raised. This moment of development of new integrative

artistic trends shows that artistic processes in Ukraine were developing in parallel or with some time lag concerning European and global trends. In the early XXth century, art education was an advanced artistic phenomenon throughout Ukraine (Kharkiv, Kyiv, Lviv, Kosiv, Vyzhnytsia, Uzhhorod, Opishnia, Myrhorod, Odesa, Dnipropetrovsk, Luhansk, and Simferopol), which had a huge impact on integration processes of all-Ukrainian and global nature. Graduates of Ukrainian academies, students of industrial schools have started a new period in the history of fine and decorative-and-applied arts, their influence on the formation and development of art education in Ukraine, towards... *art school's special-purpose functional orientation to specific targets of life (instead of the old idealistic school, which lost touch with the necessities of life); and the training of workers of a certain, clearly defined specialty* was carried out [8, p. 23]. During such a large period, art educational institutions of Ukraine and Europe underwent dramatic changes in their structure, subordination to various ministries and even countries (Austria, Poland, Romania, Soviet Ukraine, and independent Ukraine), mergers of specializations, unification of educational institutions, and establishments of new specializations (blacksmithing, tin-smithery, locksmithing, jewelry, foundry), and so forth. There occurred a difficult shift in the formation and development of art education in Ukraine with economic ups and downs, *advance* and *survival* of the very specializations of AMW, and educational institutions of the 1970s to 2000s. It is impossible to consider all this without analysing the factors contributing to art education that in one way or another were closely interconnected with socio-political and economic circumstances in which Ukraine's artistic education existed, as well as their integration interrelations with colleagues from various countries of the Western and Eastern parts of the European continent in the mid- to late XXth century. The above-mentioned was largely *immediately attached* to the needs of both the then industrial production of the European market economy of *decaying capitalism*, and the USSR's socialist planned economy in Soviet Ukraine.

It can be distinguished considerable positive adjustments in the art of AMW of this period. We can note the activities of Western and Eastern European schools, colleges, academies that have developed the direction of training specialists (jewellers, enamel workers, casters, blacksmiths,

and artists-designers). Among them were Artistic Metal Department of the Viennese Higher Art and Industrial School (Vienna, Austria), Artistic Metal Department of the Prague Higher Art and Industrial School (Prague, Czech Republic), Technical Professional School (Brno, Czech Republic), Art and Industrial School (Trnava, Czech Republic), Bijouterie Department of the Academy of Arts (Lodz, Poland), and Blacksmith Academy (Ybbsitz, Austria). Since the early XXth century, schools of modern jeweller's and caster's, enamel worker's, and artistic blacksmith's arts have successfully operated. There are, in particular, the School of Arts (Glasgow, UK), the University of Arts (London, UK), the School of Urgent Jewellery *Alchemy* (Florence, Italy), the University of Creative Arts (Kent, Surrey, UK), the School of Design and Crafts at the University of Göteborg (Gothenburg, Sweden), the Edinburgh College of Arts (Edinburgh, UK), the Design School of the Pforzheim University (Pforzheim, Germany), the Saimaa University of Applied Sciences (Imatra, Finland), the College of Art and Design at St. Luke University (Antwerp, Belgium), a design-workshop (Freiburg, Germany), a professional school (Dusseldorf, Germany), the International Foundry Workshop of the Gdansk Academy of Fine Arts (Gdansk, Poland), Istituto Statale d'Arte Pietro Selvatico (Padua, Italy), the State Art Academy (formerly – the Institute) of Estonia (Tallinn, Estonia), the Academy of Arts and Design (Riga, Latvia), the Academy of Arts and Design (Vilnius, Lithuania), and others.

These trends are mostly related to the development of plastic arts and jewellery in both Western Europe and the world. Modern European design in the realm of artistic metalworking is marked with Avant-gardism; artists are often working, creating the new by denying the past or the present. There are many individual and subjective elements in artists' vision of the ways of modern artistic metal advance. And observed is a desire to transgress common stereotypes, to be original, sometimes even startling. As an example can be taken creative works of representatives of various schools of Germany, England, Holland, USA, Czech Republic, and France [4, p. 187]. Artistic processes of AMW in these countries have become the ground for forming the main tendencies of development of compositional and stylistic design solutions of artistic works of the specified period: experiments with forms and images, texture, the scope of unconventional materials' application, which has been characteristically distinguished in jewellery. National

tradition, as well as the level of technical advances and the level of professional personnel training, determines each country's typical singularity and feature. We can assert that the main starting point within the AMW is definitely the ideas of the Bauhaus school. Leaders in applying nontraditional materials while working with metal were Italian, Dutch, German, and Austrian artists and educational schools, colleges, academies, which drastically changed an approach to solving the problem of art piece formation while training students. As the art critic M. Kravchenko notes: *A decoration becomes an autonomous object «the lesser means the greater», with shaping a style inspired by modern techniques, art and the philosophy of functionalism, minimalism and futurism* [5, p. 8]. An interesting feature of the Italian artistic metal pedagogical school was the improvisation-play between a work-decoration – *object's form, plane*, and a decoration-décor – a *sculptural* work of an architectural object. There existed a trend to make artistic blacksmithing, jeweller's goods according to principles of monumentalists, and to combine these types of art into a single stylistic concept, as the principal material, as well as to appeal to the Avant-garde aesthetics. It results from this that at the heels of the *old* Europe's countries, ideas and forms of the *modern and new art* within art education have spread throughout the countries of the former *Warsaw Pact*, primarily Czechoslovakia, Poland and the German Democratic Republic.

Around this period, under the influence of *western* currents of *experimental* art in metal, similar searches began in the Soviet art as well, in the Baltic republics (Estonia, Latvia, Lithuania), which were at the forefront of innovations in the USSR's art education. In the context of modern interpretation of jewellery and traditions of folk blacksmithing (1990s–2000s) indicative was the Estonian environment at the Estonian Academy of Arts. In addition, not the least of the peculiarities of educational institutions of the East European countries was the fact that the iron-curtain semicentennial isolation, coupled with the inaccessibility of general global tendencies of art education, in general, and art of the AMW, in particular, adversely affected in context of inclination to the principles of historical styles, treatment of folk art, as well as application of traditional materials, and regional features of metal ware's stylistic variants. It is important to note that in their fieldwork, the prevailed attention was paid to the practical utility in accordance with both production's requirements and environment's demand.

Given objective reasons for the further development of the AMW specializations, the institutions themselves, their contacts with each other (visits to exchange experiences, workshops, scientific conferences, exhibitions, industrial fairs), it is necessary to take into account their specificity of training pupils, students, as well as the handicraft craft school, which has been created through such a long stretch of time. Nevertheless, it should be noted that a vision of artists-teachers in solving the ways of development of integration processes of modern artistic metal has many individual and subjective features, and pretends to be singular and non-standard, which proved to be a new stage of their creative activity in the educational field. V. Radkevych noticed this aspect in her studies of vocational education in Ukraine: *In today's environment, there is increasing importance of vocational education's quality, its focus on forming the high level of professionalism for specialists to come, their readiness for activities, which is characterized by intellectual and creative content, the combination of mental and practical actions* [10, p. 213].

The reformation of educational process and the structural changes of art education in Ukraine were important for the further modernization of educational and production processes in cooperation with industrial production and private enterprise (in the late 1970s to early 2000s) of blacksmith's, jeweller's, and caster's specializations, and others. The production and the enterprises were growing fast in Ukraine and Europe, which in turn required a large number of young specialists in the art of forging and design of architectural metal, jewellers-modelmakers, and jewellers-designers. And with the formation of the *free* labour market in Ukraine (1990s), growth of private production (jewellery firms, and blacksmith's-welder's and caster's factories and workshops), the role of the main *helmsmen* of this *dialogue*, as well as their mutual integration, has increased. Among them are art educational establishments in the training of specialists with studying the AMW, and private entrepreneurs, workshops, firms, factories, and works. We can distinguish, in a separate developmental sphere in Ukraine, as a powerful educational complex, the process of formation, revival of vocational-technical and artistic educational institutions (schools, colleges, children's art schools, and a university's department) based on artistic traditions of the Ukrainians. On such a ground of dramatic changes, there appeared a commonly encountered problem of training future artists-designers of the AMW at Ukrainian educational institutions. The problem is multifaceted and

composite, which required and still requires, in our opinion, the development and a state-level approval of new programmes of educational process at the state level, which need separate differentiations of priority directions of educational development in each educational institution. Thus, we cannot but touch upon the issue of improving the quality of education, when there has been a significant revival of all branches of decorative and applied arts. According to O. Bezhin, urgent for the Ukrainian system of art education is *...the development and introduction of quality standards at all levels, the unification of structure of educational and qualification levels, content of basic and practical training, and the entry of the Ukrainian art education into the European and global spaces of art metalworking* [5, p. 149].

Trends of the European movement in modern conditions of the Ukrainian artistic design of the AMW occur in parallel: the development of various genres and types of decorative and applied art of the modern times; the inherent reliance on traditions; the preservation of impression and cultural context of countries in the works; the immersion into the national culture of a certain region; the significant vivacity of expository activities; the appearance of numerous state-run and private galleries; the holding of various art events; and the obtaining of general European recognition by works of many Ukrainian metal-related artists-teachers and jewellers. Among them are O. Ivasiuta, O. Bonkovskiy, S. Polubotko, I. Popyuk, S. Torulia, A. Sterniuk, V. Tymkiv, Yu. Chehil, I. Zadorozhnyi, O. Barbalat, A. Kulyhin, and V. Horodetskyi, as well as art critics in the field of artistic metal R. Shmahalo R., M. Kravchenko, I. Mishchenko, O. Rohotchenko and many others. As the Ukrainian art critic O. Marychevsky emphasizes: *Each of us brings something to the world: the reconsideration of all facets of society, the formation of a consistent personality, the responsibility and development of integration processes at an educational institution, in the state. And just like our people assert themselves, while obtaining their own place among other peoples, so we shall have sought our own language, form, line, colour, and perspective in the array of art education* [6, p. 44]. We should acknowledge that the functioning of departments and faculties with specializations *Artistic Metalworking* and *Artistic Metal* at secondary and higher educational institutions in various Ukrainian regions (Bukovyna, Halychyna, Transcarpathia, Central and Southern regions) has a formation and development history of many years standing. Among them: the Lviv

National Academy of Arts (Lviv), the Ivan Trush Lviv State College of Decorative and Applied Arts (Lviv), the Vasyl Kasiyan Kosiv Institute of Applied and Decorative Arts at the Lviv National Academy of Arts (Kosiv, Ivano-Frankivsk Region), the Mykhaylo Boychuk Kyiv State Academy of Decorative and Applied Arts and Design (Kyiv), the Transcarpathian Academy of Arts (Uzhhorod, Transcarpathian Region), the Adalbert Erdeli Uzhhorod College of Arts (Uzhhorod, Transcarpathian Region), the V. Shkribliak Vyzhnytsia College of Applied Arts (Vyzhnytsia, Chernivtsi Region), *Architecture, Construction, DAA, and Restoration* Department of the Yuriy Fedkovych Chernivtsi National University (a branch of the University in Vyzhnytsia), the Chernivtsi Vocational Rail Transport Lycée No. 14 (Chernivtsi), the Rovenky Department of the Taras Shevchenko Luhansk National Pedagogical University, and others, which all have played and still play a significant role in the field of forming a competent versatile metal-related artist throughout Ukraine.

During the last years of the late XXth to early XXIst century, within the development of the AMW, the activities of students and lecturers at Ukrainian art educational institutions have considerably increased, participating in the All-Ukrainian competition of sketches for the best jewellery design within the framework of the International specialized exhibitions *Jeweller's Expo Ukraine* (Kyiv), *The Azure Wave* (Odesa); *Forged Sculpture Park* (Donetsk), the International Blacksmith Festival *Blacksmith's Festival*, and exhibitions *Ornamental Blacksmithing* (Ivano-Frankivsk, Kyiv); International blacksmith festivals: *Hefaiston* (village of Týn nad Bečvou, Czech Republic), *Christmas Smithery* (Ybbsitz, Austria), *World Smithery Championship* (Stia, Italy), and *Four Winds openair* (Klaipeda, Lithuania). As the art critic R. Shmahalo notes: «*The Clique*» festival in Chernivtsi, identical in its culturological significance, has created, for the first time in the Bukovyna lands, conditions for the collective demonstration of interior blacksmithing by local and invited masters [12, p. 85]. The participation of students is also noticed in the international exhibition of decorative and applied arts in Romania (Suceava), as well as in all-Ukrainian expositions of arts and crafts *Christmas Show*, *Easter as the God's World* at the National Artists Union of Ukraine (Kyiv, Chernivtsi, Lviv, Odesa, Uzhhorod, and Ivano-Frankivsk), and many others. Commonly, students and future graduates of a DAADepartment mostly operate in private smithies or set up

their own blacksmith's and jeweller's workshops, apart from teaching in art schools, art studios, and schools of general education.

3. Methodological experience of art schools. Over such a large period, art educational institutions in Ukraine underwent dramatic changes in structure, the subordination to various ministries and even countries (Austria, Poland, Romania, Soviet Ukraine, independent Ukraine) during the XXth century, as well as mergers of specializations, the unification of educational institutions, and the establishment of new specializations (blacksmithing, tinsmithcraft, locksmithing, jewellery), and others, which were more directly related to the needs of the then industrial production of Soviet Ukraine and nowadays, with the ups and downs in economic development, the *survival* of the very specializations and educational institutions of the mid-1990s. The commonly encountered problem of training future artists-designers of the AMWat educational institutions is multifaceted and complicated, which requires, in our opinion, the development and a state-level approval of new legislative rules, educational process programmes, which need separate differentiations of priority directions of educational development in each educational institution. Essential for the Ukrainian art educational system is ...*the development, introduction of quality standards at all levels, the unification of structure of educational, and qualification levels, content of fundamental and practical trainings* [1, p. 149] of the entry of Ukrainian art education into the European and global spaces of artistic metalworking.

Based on studying best practices of training specialists of the relevant profile, related domestic educational institutions, *art schools* of the near and far abroad, a certain system of forming professional knowledge of metal-related artists, jewellers, blacksmiths, casters and others has been formed in Ukraine. Meanwhile, a harmoniously structured network of art educational establishments with centres for jointly developing the concept of secondary and higher art education, educational and methodological complexes for training specialists in the AMW field, has led to the process of revival, formation, development of vocational and artistic educational institutions (specialized schools, colleges, children's art schools, a university's faculty) based on artistic traditions of the Ukrainian people. Thus, in numerous Ukrainian educational institutions, with technicians being trained at the specialized department *Artistic Metalworking, Artistic Metal* in specialities *Jewellery and Artistic Blacksmithing, Artistic Weapon Decoration and Res-*

toration, there is a division by stepped educational-qualification levels of specialist attainments: *Junior Specialist, Bachelor, Specialist, and Master*.

New social and economic conditions in the Ukrainian state of the late 1990s and early 2000s contributed to this development. The period is marked with a search for new solutions in forming the structural changes of educational process and the course of integration processes with the European educational school of AMW. There is improvement of the educational and methodological provision with innovative technologies (IT) of the disciplines *Designing, Principles of Composition, Work in Stuff, Workmanship, and Improvement of Workmanship*, as well as with comprehensive programmes, methodological support. There is also the writing of new professional textbooks in meeting the requirements of the Ministry of Education and Science. Due to these changes in improving the teaching, there was a *revival*, at departments and subdepartments of the AMW in Ukrainian educational establishments, of traditional artistic high-treatment blacksmithing, enamel working and jewellery, casting of small sculptural plastic objects in the sphere of jewellery according to modern manufacturing techniques, etc. Improvement of both educational programmes and educational process organization, as well as intensification of material security of creative workshops at educational institutions, has led to high-quality training of artists-masters, designers, artists-educators in art educational establishments.

To date, the education and training of students and pupils are closely interrelated by their course works in the following disciplines: *Composition, Workmanship, Improvement of Workmanship* and others. The training is carried out by standards of industrial production, which gives reasons for students to qualitatively fulfil semester, yearly, and diploma works: from their conception and sketching to the layout making and the finishing of course works in stuff. All this contributes to the growth of knowledge, practical learning of theory and practice, the process of contact revival, the expansion of direct communication with private industrial base enterprises of jewellery and blacksmithing profiles in different Ukrainian regions.

It can be noted that the significant revival of art expositional activities among teachers of educational establishments has led to the anticipated results in training specialists of the AMW. Numerous public and private galleries have appeared. Various art events and masterclasses are held to show the works, while being thoughtful of preserving folk traditions of Buk-

ovyna and Hutsulshchyna, Transcarpathia, Podillia, Kyivshchyna and other regions of our country. Among many Ukrainian metal- and jewellery-related artists-educators, which have received European recognition, are O. Ivasiuta, O. Bonkovskiyi, A. Sterniuk, R. Shmahalo, O. Luchynskiyi, A. Cholan (Lviv); S. Polubotko, V. Horodetskiy (Ivano-Frankivsk); I. Popyuk, S. Torulia (Rivne); I. Didyk, V. Tymkiv, Yu. Chehil (Uzhhorod); I. Zadorozhnyi, I. Trufen, I. Popyuk (Vyzhnytsia, Chernivtsi Region); O. Barbalat, A. Kulyhin, I. Popyuk (Kyiv); M. Salyha, M. Lukaniuk, O. Harkus (Kosiv, Ivan-Frankivsk Region); M. Chornyi, A. Biednyi (Chernivtsi), due to their participation in numerous symposiums, open airs, exhibitions and many other art events.

Higher educational establishments with qualifying levels *Bachelor*, *Specialist*, and *Master* (4th accreditation level) train artists-educators, artists of decorative and applied arts, who, in addition to mastering the techniques and technologies of metalworking, can engage both their research and pedagogical work, and unassisted creative and expositional activities. The teaching staff of departments is distinguished by a high level of professionalism and workmanship in presenting practical material in the specialities *Jewellery*, *Blacksmithing*, *Artistic Weapon Decoration and Restoration*, as well as the subjects of special disciplines *Graduation Work Designing*, *Summer Internship*, *Special Drawing*, *Composition*, *Workmanship*, *Independent Work in Stuff*, and others. Developed are curricula and learner's guides by speciality in the context of integration with the global art of forged artistic metal and jewellery, which has long-standing traditions in the western region of Ukraine. The training is carried out at educational and qualifying levels *Bachelor* (third and fourth academic years) and *Specialist* (fifth year). First of all, high requirements are set for the professional creation and realization of a composition as an implementation of an author's idea. Educational and practical tasks also have the artistic direction. A particular attention is paid to the fulfilment of a graduation project (embracing an explanatory note, graphic part, and work in material). Students of educational and qualifying levels *Bachelor* and *Master* (fourth and fifth academic years) work on the diploma work's theme, with creating their own projects and realizing them by the chosen topic – a project's part along with its implementation in stuff. *Masters*, in addition to accomplishing a work in material, write a research paper on a selected topic.

Educational institutions of second and third accreditation levels (institutes, colleges) provide a good vocational training for students. The Vasyl Kasiyan Kosiv Institute of Applied and Decorative Arts at the Lviv National Academy of Arts (Kosiv, Ivano-Frankivsk Region), the Mykhaylo Boychuk Kyiv State Academy of Decorative and Applied Arts and Design (Kyiv), the Adalbert Erdeli Uzhhorod College of Arts (Uzhhorod, Transcarpathian Region), and the V. Shkribliak Vyzhnytsia College of Applied Arts (Vyzhnytsia, Chernivtsi Region) are of the middle level.

In general, these are state-run art educational institutions (colleges, institutes), which provide training at the educational and qualifying level *Junior Specialist*. *The duration of the training is four years. Entrants are admitted based on incomplete or complete secondary education (accordingly, for the first or second year of study), while receiving a degree in the specialities «Artist-Master of Artistic Metalworking», «Jewellery», and «Artistic Blacksmithing» [9, p. 239].*

It is worth mentioning the oldest and most famous establishments: the Ivan Trush Lviv State College of Decorative and Applied Arts (Lviv) and the V. Shkribliak Vyzhnytsia College of Applied Arts (Vyzhnytsia, Chernivtsi Region). They are among the earliest art establishments in Ukraine to train specialists in art metalworking (chasers, jewellers, engravers, casters, blacksmiths, enamel workers, filigree workers, soldering workers, and tinsmiths).

We consider it expedient to distinguish vocational schools and professionallycées of Ukraine, notably the Chernivtsi Vocational Rail Transport Lycée No. 14 (Chernivtsi), the Interregional Kyiv Jewellery Academy (Kyiv), the Academy of Jewellery (Odesa), the Ivano-Frankivsk Vocational School No. 24 (Ivano-Frankivsk), and others. They have a specialized direction of the first level of training specialists in technical professions in the field of *blacksmithing* and *jewellery*. The classes in the educational and qualifying level *Skilled Worker* (the term of study at lycées is either three years upon the nine-year secondary education at a school, or a year and a half after the complete secondary education) are arranged in such a way that the study, as well as the implementation of the curricula, is carried out in a mutual complementation of disciplines, combination of technical and artistic aspects of blacksmith's craft and jewellery. Students, future masters, deal with, through their three-year education, the following special disciplines: *Jewellery Techniques, Techniques of Producing Forged Metalwork, Special*

Blacksmithing Techniques, Learning While at Work, Material Science, Engineering Drawing, Composition, and Drawing. The disciplines open up a wide range of opportunities for students to improve their workmanship in theoretical and practical skills.

Thus, in the previous decades of their formation and development (1970s to late 2000s), Ukrainian educational establishments in the speciality of the AMW (specialized schools, vocational schools, institutes, academies) have worked out and enriched the techniques of jewellery and artistic foundry (aluminum, bronze, brass, precious metals), artistic blacksmithing, stone faceting, chasing, artistic enamel working, etc. This has found its newest and experimental expression in decorating models for casting (jewellery), with creating a large collection of small sculptural plastic objects, interior design ware, decorative architectural elements, and so on. A large number of alumni work at various manufacturing enterprises, workshops, and lately go abroad to work, thus integrating themselves into the European labour market.

Therefore, the restructuring of art education at the level of consciousness, as well as the integration into artistic processes, exhibition activities, volunteering of educational projects among institutions is an urgent need of nowadays. There is also the necessity to study as thoroughly as possible the experiences of past years, while looking to the future, to borrow the best achievements of colleagues from European educational institutions. All this is significant and decisive in creating the conditions for integration processes: the formation of an artist (blacksmith, jeweller, caster) staying in such educational environments as an educational institution, production process, courses, competitions, festivals, forums, the Internet, and associations. This would later enable students to provide themselves with equal opportunities for the development and use of their potencies, and would give each child, pupil, and student the opportunity to realize the most important necessity of an individual through his/her active artistic activity and creative self-expression in the sphere of artistic metal.

3. Regularities of training model designers and designers of the AMW

While analysing the development of artistic metal and the history of national and European art education of the late XXth to early XXIst century, we cannot but mention that the reformation of the educational process during this period, along with structural changes, was and is still important

for the further modernization of integration processes within education and industrial production of nowadays in context of Ukrainian and European spaces. The decisive factor in creating conditions for professional art education of the AMW, according to V. Radkevych, is *the formation of an artist (blacksmith, jeweller, caster, enamel worker, engraver, chaser, welder) of comprehensive, general-profession, general artistic and special-profession levels, the elements of each of which are theoretical knowledge and practical skills, on whose ground these specialists develop their competence and experience for the independent creative activities of experts in the field of decorative and applied arts, particularly jewellers and blacksmiths* [11, p. 218]. However, there emerges the need for reorganizing the educational process of art education according to modern requirements, as well as studying and mastering the achievements, and further improving new trends of artistic metal development. The researcher M. Boyanovska believes that relevant for teaching students in higher art educational establishments is a methodology that would focus on such artistic and pedagogical techniques as integrative and problem-heuristic methods, as well as techniques of educational support and pedagogical maintenance, which are especially significant for the full realization of education and formation of artistic and aesthetic competence of students of art speciality [2, p. 318].

Carriers of specific features of each art institution in Ukraine and Europe, which train in metalworking specializations, have their inherent regularities. These regularities include: firstly, the forms and means, which can be operated by art education, as well as information availability; secondly, the multi-vector nature of paths of creative search; thirdly, the possibility of coexistence, among educational institutions, even within the framework of one project, of various forms of art, combined by one idea; fourthly, the probability for a student-artist to choose the optimal type of behavior. And this leads to new socio-cultural trends in the artistic metal development, in particular, related to the global integration expansion of the mass media (Internet, Facebook, Instagram, Google), which largely affect the nature of art education. After all, in today's information-oriented society, the *idiot box*, *tablets* and mass communication media influence the aesthetic attitude of pupils and students to the world. The scholar N. Hontarovska draws our attention and emphasizes that due to the universality of artistically figurative language in the multicultural space, students are able to engage in nonverbal dialogue with different cul-

tures of the past and present, to understand others and thereby develop their own spiritual world. Education acquires a culturological orientation, encompassing all the major components of the artistic and aesthetic experience of an individual [3, pp. 37–39]. The question is about the educational process: the study of speciality *Composition (Design)*, the mastering of achievements of digital technologies, as well as their further improvement and developmental introduction of new trends of the AMW, if skills and knowledge are used reasonably, logically and purposefully.

Based on the foregoing, we can affirm that the main purpose of a new understanding of functions and principles of art education of the AMW is as follows:

- supporting the development for the disclosure of creative abilities;
- promoting the development of morality and an ethical attitude and respect for others, forming tolerance in relationships with other people;
- fostering the ability of an individual to realize his/her own development as an integral part of national culture;
- increasing the creativity, nurturing the individual abilities of a person by means of comprehensive usage of various kinds of arts (music, cinema, theatre);
- mastering the system of artistic knowledge, cultural heritage, artistic and ethical concepts and categories.

Hence, there appears the necessity to reorganize the educational process, which would focus not only on the creative mastery of basic knowledge, but also on the development of abilities, skills and the wish to learn independently, to acquire new information, the dexterity of using the knowledge gained in practice, the creation of necessary links for incessant lifelong learning (viz. school, college, university, advanced studies). Therefore, the problem is set to form the relationships within the integration sphere: the structure of education and industrial facilities (workshops, factories and works), related to the production of art goods, as well as artistic and industrial forums and exhibitions, just like managers and teachers for further cooperation and product advertising. The question is virtually about a personality with a status (student, future worker, production manager, etc.), not only with innovative mindset, culture and behavior, but also orientated towards developing abilities, knowledge, skills and the desire to independently learn management of advertising their acquired knowledge. Thus, the need also appears to become proficient in new

knowledge related to metalworking (tools, outfit, techniques) and the design dealing with digital software technologies (computer graphics, 3D modelling), upon which to apply the acquired skills and knowledge in practice in yearly and graduate projects. And the latter implies the need for integrating processes in organizing an educational institution's preparation for market conditions (invention – realization – sale of projects and works). In such a way, necessary links for incessant lifelong learning are created (school, college, university, postgraduate education, industry, and creation of a workshop, firm, or corporation).

Priority should be given to *dialogue* and the strategy of pedagogical interaction coloured by positive emotional and aesthetic experiences developed by artistic activity, dominance of success and enjoyment on the path to learning about art. The term *dialogue* implies not just talk, conversation, but above all a chain of interdependent verbal communications between a teacher and a pupil, student, a head of an art enterprise or a factory based on partnership, among cultural workers and figures of art and cinematograph. It also means the exchange of personal spiritual values (history and art museums, exhibitions, competitions, drama and music theatres, musical and art schools, groups of folk, ballroom, and modern dances).

4. Modern trends of integration relations of art education of the AMW

Globalization processes have considerably expanded integration possibilities, the sphere of influence and interaction, interrelations not only of art educational figures and institutions, but also of states and peoples, economic entities. Their ability to remain independent and conscious individuals in the diverse interlacement of integration ties and the influences of information flows across the European and Ukrainian spaces.

A **decisive condition** for implementing the integration concept of art educational institutions is a comprehensive solution of problems concerning education's security at the level of state laws and educational institutions in the following areas:

1. Regulatory support

(the need to develop and adopt the *Law on General Art Education*).

2. Methodological support

(the creation of methodological complexes, programmes, textbooks, encyclopedic knowledge, workbooks, websites, and WEB-pages).

3. Staffing

(the modernization of higher education and postgraduate pedagogical and artistic education, probation (courses, production process, open airs, universities of leading countries of the world)).

4. Logistical support

(due to persistent scarcity of funds, lack of technical equipment for art education (audio-visual facilities, video materials from competitions and festivals, slides, etc.) in the conditions of the informational and technical society. The attraction of private industry for supporting educational institutions on a contractual basis) [7, p. 4].

While considering modern ways of integrative improvement of the art educational system, we can not but deal with the theme of the Ukrainian art education's entry in the global space of artistic metalworking. This will be facilitated not only by efforts at the private and public levels, but also by an active stand, at the international scene, of each of educational institutions (colleges, universities, and academies). The more they will be presented in a positive perspective abroad, as participants of various projects, programmes, forums, exhibitions, conferences, the better it will work for the positive image of our country as a whole. Such international competitions and festivals are of paramount importance for the development of art education (in the specialities of blacksmithing and jewellery). The exchange of practical experience, master classes, and modern means of communication with masters – all this lead to an understanding of the essence of integration global processes, universal cultural phenomena of Europe and the world.

5. Conclusions

While summarizing the results of this study, it should be noted that today in the Ukrainian art education, namely in the field of art metalworking, the model (schemes) of current and future relationships between Ukrainian and European educational institutions with related occupational profiles in training specialists is not fully disclosed and implemented. At the same time, the need for their orientation to cooperation requires increasing quantitative and qualitative shifts in the field of inter-university coordination in the realm of educational projects, grounded on conventional and innovative principles of decorative and applied arts, the experience in studying modern production technological requirements.

Thus, the integration processes of art education are spreading very quickly, with taking into account globalization processes between countries and continents, which lies in the interaction of several parties of this process. Art education and the culture of artistic metalworking in both Ukraine and Europe act as a carrier of tangible heritage, which gathers concentrated experience of generations in a form suitable for individual use, while educating young people (pupils, students) and teachers in adherence to art and folk traditions in everyday life, which has evolved and now enable us to reconstruct the organic worldview throughout millennia.

At the same time, it is uncovered that the Central European countries were the centre of innovative integration trends in the education of artistic metal of the late XXth century. It was there that the movement of *new tendencies* of formation, development, creation of design in artistic metal (blacksmithing, jewellery, chasing, artistic foundry, etc.) has appeared and received its intrinsic artistic trends, concepts reflected in the works of European and Ukrainian artists. The result of these transformations are changes that influenced the formation of educational programmes at art institutions in the Netherlands, Germany, Austria, Italy, Czech Republic, Slovakia, Poland, Lithuania, Latvia, Estonia, Ukraine, and Russia. The value of art education's curricula consisted in the provision of an individual with self-reliant, independent work, as well as in the interconnection between a student, a teacher of an educational institution, on the one hand, and industrial production and exhibition activity, on the other.

The study of integrative artistic peculiarities between educational establishments of Ukraine and Europe of the late XXth to early XXIst century made it possible to distinguish the following creative trends by differentiable structure:

– Utility and intelligibility of images, topics, yearly projects and graduate works, which are different from European works of art (blacksmithing, jewellery, and monumental metalwork), can be traced back to the 1970s–1980s. Pupils, students, and artists appealed to conventional blacksmithing and jewellery techniques and materials, with referring to folk art and historical epochs – from the art of Trypillia to the Secession and Art Deco;

– Acquisition of new structural and figurative forms and conceptual content (1990s to 2010s). Young authors, students, and teachers experimented with stuff and forms, techniques, synthesized various materials with the

ones non-traditional for blacksmithing, foundry, jewellery, with embodying a figurative and plastic design in each product;

– New and modern elucidation and interpretation of yearly projects and graduate works (Matura diplomas) as a plastic, constructive form with the use of various materials, with transcending the traditional perception of blacksmith's, jeweller's, and enamel worker's art, being on the verge of decorative-and-applied and fine arts.

Based on the above-mentioned, we recommend the following points: *to improve* the system of art education via the deepened interaction of all structural units of educational institutions (children's art schools, studios, vocational schools, specialized schools, colleges, universities, and academies) concerning the preparation of future specialists in artistic metal, as well as by involving them in creative, expositional, research and experimental activities within their own educational establishments and on other artistic grounds of the state and beyond. The study of special disciplines by profession (principles of composition and shaping, work in stuff, professional techniques of artistic metalworking, mechanical design, sculpture, drawing, etc.) should *be brought* to practical implementation according to modern requirements and trends in the development of art education. Given a number of criteria, a special attention is *to be paid* to participation in video-conferences, master classes, practical open airs, symposia, festivals, exhibitions, which bring forth mainly the independent and individual work of a student during the *formation* in the course of his/her studies. Hereupon, a new type of future ICT worker (designer, designer-modeller in 3D programmes) is *born*. This leads to studying and mastering mobile production technologies, printers for models and clichés in producing metalwork (blacksmithing, foundry, plasma metal cutting, jewellery, etc.), which is conducive to the formation of incentives for creative activities of future artistic metalworking masters.

The results of our study show that the development of innovative techniques of the Ukrainian art education has revealed a lag, some imperfection of organizational and educational, as well as integration conditions in comparison with corresponding European institutions, which contribute to the formation of motivations for creative activities of future experts in artistic metal. A weak resource base in filling workshops with practical knowledge, in computerizing lecture rooms with designing by IT

programmes, the re-training of teaching staff of the *older* generation in their mastering modern methods of remote learning – all this do not favour the comprehensive process of integration into the European educational space. However, despite this situation, professional teachers of Ukrainian art educational institutions attest, by their creative potential, a high level of creative work in the field of artistic metal demonstrated by their students at international exhibitions and festivals. The integration processes that take place among art educational institutions have shown an evolutionary and comprehensive combination of approaches, methods, means, and forms of learning. They have also revealed the affinity (proximity) of basic principles of teaching special disciplines of artistic metal, provided with a proper digital educational environment and an appropriate electronic context. This hereby gives effective *instruments* for the quality training with informative competence for future specialists to entry into the global space of modern artistic metal.

Based on analysing the topic under study, we have substantiated the following description and drawn the following conclusions:

It is *defined* that among the art institutions of Ukraine and Europe under study, there are ones recognized internationally and globally in the rating among art schools in training specialists in metalworking.

It is *proved* that the training of students, pupils, postgraduate students in educational and methodological programmes, modern innovative principles and techniques of teaching metalworking have led to the revival of the craft in blacksmithing and jewellery, foundry, enamel working, chasing, which is a significant contribution to the Ukrainian and West European metalworking traditions.

It is *revealed* that the cooperation that existed between educational institutions has led to the inter-university realization of artistic creative ideas, projects, open airs, forums, conferences, and festivals, which confirmed their implementation in practice in material, as well as the connection with traditions of these regions among themselves.

By the method of comparative analysis, it is *substantiated* the community of the principal trend of students' training, as well as the singularity of *schools* at educational institutions; it is also *found out* that art education and a modern level of training specialists have related themes of ideas, goals, an aim, and realization.

It is *ascertained* that since the late XXth to early XXIst century, the mutual cultural exchange of delegations among educational institutions has been of great importance. It includes the defence of courseworks and graduation works, cooperation during blacksmithing and jewellery exhibitions. The mutual exchange encourages the further strengthening and development of integration processes, the propagation of cultures of local regional *schools*, and the preservation of their traditional spiritual values and uniqueness of their stylistic features.

Our further studies have highlighted the need, given the aforementioned, of the offer to deepen and legislatively regulate the integration cultural exchange between art educational institutions of Ukraine and Europe, which consists in the interaction of the parties, occupation in studying and consolidating gained common relations, achievements on the art labour market with the specific *subject* and the sphere of activities. This market is distinguished by modern educational institutions' free development of personality, which stimulates the rational perception of the world in accordance with rules of cosmic concord, having a positive impact on creative abilities of not only an individual, but also society overall.

References:

1. Bezhin O. (2008). *Problemy mystetskoyi osvity: Typologichni kryteriyi ta naukovo-metodychna rozrobka* [Problems of Art Education: Typological Criteria and Methodological Development]. Institute for Cultural Research of the National Academy of Arts of Ukraine (composite author – O. Bezhin (composite author's head), H. Bernadska, I. Kocharyan, O. Datsko, and O. Uspenska). Kyiv: SPD *Holosuy*, p. 149. (in Ukrainian)
2. Boyanovska M. (2008). *Innovatsiyini tekhnolohiyi v shkilnyy khudozhniy osviti* [Innovation Techniques in the Sphere of School Art Education]. *Visnyk Lvivskoyi natsionalnoyi akademiyi mystetstv* [Bulletin of the Lviv National Academy of Arts]. Lviv: LNAM, special edition V, p. 318. (in Ukrainian)
3. Hontarovska N. (2001). *Kontseptsiya kulturolohichnoho rozvytku osobystosti v NVK # 28 m. Dnipropetrovsk* [Concept of a Personality's Culturological Development at the No. 28 Educational Complex in the City of Dnipropetrovsk]. *Mystetstvo ta osvita* [Art and Education]. Kyiv, no. 3, pp. 37–39. (in Ukrainian)
4. Kravchenko M. (2012). *Avtorski khudozhni prykrasy v Ukrayini (kinets XX – pochatok XXI st.)* [Auctorial Decorations in Ukraine (Late XXth to Early XXIst Century)]. *Obrazotvorche mystetstvo* [Fine Arts]. Kyiv, nos. 3–4, p. 187. (in Ukrainian)
5. Kravchenko M. (2017). *Mystetstvo prykras v Ukrayini ostannioyi tretny XX – pochatku XXI stolittia: yevropeyskyy kontekst, khudozhni osoblyvosti*,

Chapter «History of art»

personalii [Decoration Art in Ukraine in the Last Third of the XXth Century to Early XXIst Century: A European Context, Artistic Features, and Personalities]. [A Manuscript]. An author's abstract of Ph.D. thesis in Art Criticism: speciality 17.00.06 / *Lviv National Academy of Arts*. Lviv, p. 8. (in Ukrainian)

6. Marychevskiy M. (2004). *Obrazotvorche mystetstvo* [Fine Arts]. Kyiv, no. 4, p. 44. (in Ukrainian)

7. Masol Liudmyla (2004). Kontsepsiya zahalnoyi mystetskoyi osvity [Concept of General Art Education]. *Mystetstvo ta osvita* [Art and Education]. Kyiv, no. 1, pp. 2–4. (in Ukrainian)

8. Mishchenko I. (2000). Diyalnist mystetskykh obyednan na terenakh Bukovyny u 1895–1910-kh rokakh (za materialamy arkhivu Chernivetskoyi oblasti) [Activities of Art Associations in the Territory of Bukovyna in 1895–1910 (After the Materials of the state Archives of Chernivtsi Region)]. *Visnyk Lvivskoyi natsionalnoyi akademiyi mystetstv* [Bulletin of the Lviv National Academy of Arts]. Lviv, ed. 11, p. 23. (in Ukrainian)

9. Pasichnyk L. (2017). *Yuvelinne mystetstvo Ukrayiny XX–XXI stolit* [Ukrainian Jeweller's Art in the XXth to XXIst Century]. A scientific edition of the National Academy of Sciences of Ukraine's M. Ryl'skyi Institute of Art Studies, Folkloristics and Ethnology. Kyiv: Scientific Production Association *Vydavnytstvo Naukova dumka* of the NASU, p. 239. (in Ukrainian)

10. Radkevych V. (2010). *Teoretychni ta metodychni zasady profesynoho navchannia u zakladakh proftekhosvity: monohrafiya* [Theoretical and Methodological Principles of Vocational Training at Art-Profile Vocational Technical Training Institutions: A Monograph]. Edited by the member of the National Academy of Educational Sciences of Ukraine Nellia Nychkalo; NAESU, Ivan Ziazun Institute of Teacher Education and Adult Education. Kyiv: UkrINTEI, 213 p. (in Ukrainian)

11. Radchenko A. (2009). *Derevyanyy ta metalevyvy dekor u miskiy arkhitekturi Hutsulshchyny i Pokuttia naprykintsi XIX – u pershiy tretyni XX st.* [Wooden and Metal Decoration of the Hutsulshchyna and Pokuttia Urban Architecture in the Late XIXth to the First Third of the XXth Century]. Ph.D. in Art Criticism thesis: speciality 17.00.06; Vasyl Stefanyk Carpathian National University. Ivano-Frankivsk, p. 218. (in Ukrainian)

12. Shmahalo R. (2015). *Entsyklopediya khudozhni oho metalu: v 3-kh tomakh* [The Encyclopedia of Artistic Metal: in Three Volumes]. Lviv: Apriori, vol. II: Khudozhniy metal Ukrayiny XX – poch. XXI stolittia [Ukrainian Artistic Metal of the XXth to Early XXIst Century], p. 85. (in Ukrainian)