

loom was an important step in the development of computers because the use of punched cards to define woven patterns can be viewed as an early, albeit limited, form of programmability.

It was the fusion of automatic calculation with programmability that produced the first recognizable computers. In 1837, Charles Babbage was the first to conceptualize and design a fully programmable mechanical computer, his analytical engine. Limited finances and Babbage's inability to resist tinkering with the design meant that the device was never completed.

In the late 1880s, Herman Hollerith invented the recording of data on a machine readable medium. Prior uses of machine readable media, above, had been for control, not data. «After some initial trials with paper tape, he settled on punched cards ...» To process these punched cards he invented the tabulator, and the keypunch machines. These three inventions were the foundation of the modern information processing industry. Large-scale automated data processing of punched cards was performed for the 1890 United States Census by Hollerith's company, which later became the core of IBM. By the end of the 19th century a number of technologies that would later prove useful in the realization of practical computers had begun to appear: the punched card, Boolean algebra, the vacuum tube (thermionic valve) and the teleprinter.

During the first half of the 20th century, many scientific computing needs were met by increasingly sophisticated analog computers, which used a direct mechanical or electrical model of the problem as a basis for computation. However, these were not programmable and generally lacked the versatility and accuracy of modern digital computers.

Alan Turing is widely regarded to be the father of modern computer science. In 1936 Turing provided an influential formalisation of the concept of the algorithm and computation with the Turing machine. Of his role in the modern computer, Time Magazine in naming Turing one of the 100 most influential people of the 20th century, states: «The fact remains that everyone who taps at a keyboard, opening a spreadsheet or a word-processing program, is working on an incarnation of a Turing machine.»

The inventor of the program-controlled computer was Konrad Zuse, who built the first working computer in 1941 and later in 1955 the first computer based on magnetic storage.

George Stibitz is internationally recognized as a father of the modern digital computer. While working at Bell Labs in November 1937, Stibitz invented and built a relay-based calculator he dubbed the «Model K» (for «kitchen table», on which he had assembled it), which was the first to use binary circuits to perform an arithmetic operation. Later models added greater sophistication including complex arithmetic and programmability.

A succession of steadily more powerful and flexible computing devices were constructed in the 1930s and 1940s, gradually adding the key features that are seen

in modern computers. The use of digital electronics (largely invented by Claude Shannon in 1937) and more flexible programmability were vitally important steps, but defining one point along this road as «the first digital electronic computer» is difficult. Notable achievements include:

- EDSAC was one of the first computers to implement the stored program (von Neumann) architecture.
- Die of an Intel 80486DX2 microprocessor (actual size: 12x6.75 mm) in its packaging.

Konrad Zuse's electromechanical «Z machines». The Z3 (1941) was the first working machine featuring binary arithmetic, including floating point arithmetic and a measure of programmability. In 1998 the Z3 was proved to be Turing complete, therefore being the world's first operational computer.

The non-programmable Atanasoff-Berry Computer (1941) which used vacuum tube based computation, binary numbers, and regenerative capacitor memory. The use of regenerative memory allowed it to be much more compact than its peers (being approximately the size of a large desk or workbench), since intermediate results could be stored and then fed back into the same set of computation elements.

The secret British Colossus computers (1943), which had limited programmability but demonstrated that a device using thousands of tubes could be reasonably reliable and electronically reprogrammable. It was used for breaking German wartime codes.

The Harvard Mark I (1944), a large-scale electromechanical computer with limited programmability.

The U.S. Army's Ballistic Research Laboratory ENIAC (1946), which used decimal arithmetic and is sometimes called the first general purpose electronic computer (since Konrad Zuse's Z3 of 1941 used electromagnets instead of electronics). Initially, however, ENIAC had an inflexible architecture which essentially required rewiring to change its programming.

Several developers of ENIAC, recognizing its flaws, came up with a far more flexible and elegant design, which came to be known as the «stored program architecture» or von Neumann architecture. This design was first formally described by John von Neumann in the paper First Draft of a Report on the EDVAC, distributed in 1945. A number of projects to develop computers based on the stored-program architecture commenced around this time, the first of these being completed in Great Britain. The first to be demonstrated working was the Manchester Small-Scale Experimental Machine (SSEM or «Baby»), while the EDSAC, completed a year after SSEM, was the first practical implementation of the stored program design. Shortly thereafter, the machine originally described by von Neumann's paper—EDVAC—was completed but did not see full-time use for an additional two years.

Nearly all modern computers implement some form of the stored-program architecture, making it the single

trait by which the word «computer» is now defined. While the technologies used in computers have changed dramatically since the first electronic, general-purpose computers of the 1940's, most still use the von Neumann architecture.

Computers using vacuum tubes as their electronic elements were in use throughout the 1950s, but by the 1960s had been largely replaced by transistor-based machines, which were smaller, faster, cheaper to produce, required less power, and were more reliable. The first transistorised computer was demonstrated at the University of Manchester in 1953. In the 1970s, integrated circuit technology and the subsequent creation of microprocessors, such as the Intel 4004, further decreased size and cost and further increased speed and reliability of computers. By the late 1970s, many products such as video recorders contained dedicated computers called microcontrollers, and they started to appear as a replacement to mechanical controls in domestic appliances such as washing machines. The 1980s witnessed home computers and the now ubiquitous personal computer. With the evolution of the Internet, personal computers are becoming as common as the television and the telephone in the household.

Modern smartphones are fully-programmable computers in their own right, and as of 2009 may well be the most common form of such computers in existence.

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Поступила в редакцию 10.03.2011.

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#### MAIN TRENDS IN GERMANIC STUDIES IN THE PERIOD OF INDEPENDENCE OF AZERBAIJAN REPUBLIC

*The paper investigates the mainstream trends in the history of the Germanic studies in Azerbaijan. The special attention was attached to the period of independence since 1991 as this period is characterized by the fast development of in these studies.*

There were certain scientific researches dealing with Germanic studies in different fields in Azerbaijan up to the beginning of the 90th of the last century. During those years textbooks for all grades of the secondary school were prepared on the basis of a common curriculum Textbooks, teaching aids, methodical instructions, reading materials for developing oral speech, habits were written for higher educational schools both for specialists of the humanities and natural sciences. All these prove that Germanistics was formed as a special field in the republic and much work had been done in this direction. Since the beginning of the 90th of the last century these achievements have been intensively developed.

On October 18, 1991, the «Constitution Act about the state independence of Azerbaijan» was adopted and the new era in the history of Azerbaijan began. At last, Azerbaijan people, after a long period of re-gained the possibility of building democratic, legal secular state, of creating its state institutions. Now there was a foundation for the direction towards of market economy, for strengthening the statehood, for permanent independence. Azerbaijan passed through the outer and inner discords, wars, fights step by step, hardly but went forward with optimism, belief, steadfastness. During a short period our republic became member of UNO, OSCE, Black Sea Economic Cooperation organization, CIS, began political, economical cooperation with developed countries of the world, including neighboring countries and widened economical ties, made international foothold to save its independence in the political, economical, legal spheres. It is natural that it gained these achievements not easily. On the one hand the Azerbaijanis were driven from Western Azerbaijan territories, on the other hand Armenia began undeclared war against Azerbaijan and invaded our territories and thus threatened our independence. In the second half of 80th in the XX century the Azerbaijan people unaware of the cunning policy of Armenians in Garabagh and Western Azerbaijan became enraged when the Armenians began annihilating the Topkhana forest

near the town of Shusha and began gathering in Azadlig Square to protest against the unpleasant processes in the republic and demanded to take serious measures against the overstepping Armenian state.

But the tension, disorder, frequent changes of the state leaders in the republic went on for several years. At last, Heydar Aliyev, who couldn't be indifferent to the fate of his people came to Baku on June 9, 1993 and was elected Speaker of the Milli Mejlis on June 15. On the 24th of June by the decision of the MM the authorities of the President were given to Heydar Aliyev.

Heydar Aliyev, who passed a great governing school in the leadership of the huge country like USSR and had a great experience of a leader began solving the problems in the republic during a short time, saved the country which was in deep social, political and economical crisis. He put an end to all the disorders, contradictions, political and economical crises, powerlessness, arbitrariness during only two years. In 1994, in May, he achieved a ceasefire at war with Armenia. The President of the republic, the whole-nation leader gave an objective and just estimation to the situation of that period afterwards: "Stopping the war, regulation of the internal situation strengthening of socio-political stability, regulation of the tension in the region among Azerbaijan and neighboring countries conditioned the life and further development of Azerbaijan as an independent state"

The socio-political processes in the life of the country reflected their influence to the education system. The problems dealing with Germanistics began developing again. In the solving of these problems side by side with the leadership of the country, the specialists in this sphere also played a great role. After re-gaining independence, direct economical, political and cultural relations began increasing with great speed in the republic and it gave importance to the study of foreign languages as well as Germanistics. Researching, teaching of foreign languages, including the Germanic languages, in all scientific and education centers of the republic gained a great importance and became one of the actual problems. During the years of independence the research works begun earlier were developed, a new generation of germanists grew. The experienced germanist scholars continue their research works and at the same time they work in the direction of preparing young germanists. All these are the demands of time, development of society, interrelation of different languages, integration and globalization processes. During the years of independence our germanist scholars work with greater energy and enthusiasm, continue successfully their work in different fields of Germanistics.

During the first years of independence all spheres and Ministers of the republic, including Azerbaijan Republic Ministry of Education, demanded the chiefs of all higher educational institutions to build their work according to the modern demands of the world, to increase the quality of education, to regulate their work in the field of research works, to begin necessary reforms on the basis of existing structures.

At the end of the XX century and in the beginning of the XXI century the relations of the Azerbaijan republic were developed concerning the world countries, especially with the USA and Europe. These relations entered a new period. The signing of the oil contract- "The Contract of the Century", the restoration of the famous "Silk Route", the admission of the Republic to the European Council increased the authority of the country, helped it to be known as a "reliable partner" in the international sphere.

As a result of the internal and foreign policy of the President of Azerbaijan it became a leading state in the region it is situated. The processes happening in the life of republic conditioned the re-structuring the education system on a high level answering the demands of the modern life. In order to make changes in this sphere the President of Azerbaijan signed a document of education reform program in the republic on June 15, 1999. That document was of great importance in governing the education, in carrying out scientific researches, building this work on the world level standards, in improving the quality of the preparation of specialists and in improving the contents of education.

During the years of independence wide relations among the schools of specialists of Great Britain, the USA, Luxemburg, Korea, Austria, Turkiye, Belgium, Italy, Russia, Kazakhstan and other country's germanists were carried out, there were exchanges of teachers with several higher educational schools, the outstanding language scholars were invited to the republic to give lectures. The teaching staff of the Azerbaijan University of Languages was very active in this work. They took an active part at the conferences, symposiums with their lectures, presentations and gave lectures in the USA and European higher educational schools.

During the years of independence expedient actions were carried out in the direction of preparing the scientific-pedagogical specialists in the republic, great attention was paid to the establishing of scientific researches, preparation and publishing of textbooks, teaching aids and programs.

Every specialist working in the direction of Germanistics must answer the demands that the textbooks, teaching aids, monographs, scientific articles, educational-methodical works written in this field must meet the requirements of the day, their results must be used widely in the practical activity and by this way scientific potential must be enriched.

Taking into consideration these demands many specialists improving their scientific activity defended Ph.D and doctorship theses and prepared important monographs in the field of Germanistics. As an examples we can show the works written by F.Zeynalov ("The problem of Difference in Languages and isomorphism of Rhythmic Structures") [1], A.Mammadov ("The system of Formal Connections in the organization of Text") [2], M.Gaziyeva ("Linguistic Problems of Stage Speech" (on the basis of English and Azerbaijan languages) [3], D. Ismayilova ("The Methods of Dialogic Speech of the English Language in the first and second years of

Education in the Language Universities"), G.Huseynzadeh ("Lingual-didactic analysis of speech communication in English"), Sh.Khalilli ("Azerbaijan-English Literary Relations" (Old and Middle Ages Period), D.Yunusov ("Variety of Complex Syntactic Units in Different system Languages") [3] and so on.

It goes without saying that as in all spheres in the republic, in the field of education, scientific researches the achievements are increasing and the gained progress showed its influence in Germanistics in number and in quality.

In the scientific – theoretical works written during the years of independence sometimes different authors researched the problems of Germanistics individually. The major of the researched works were authoritative and actual. A.Huseynov "The Noun in English and Azerbaijan Languages and Comparative – typological Research of its Grammatical Categories", R. Shabanov's "The Expression of Modality in Different Tense Forms", A.Dadashov's "Phonetical Rules of Giving English Personal and Geographical Names in the Azerbaijan Language", S.Azizov's "Phonological Problems of the Word", E.Hajiyev's "Functional-Semantic Analysis of Secondary Parts of Speech in Different –System Languages" [4], E.Mirzayev's "Prosodical Organization of English Vocative Units" (in comparison with the Azerbaijan Language), J.Mammadov's "Evolution of the Afro-American language in the USA", D.Yunusov's "Variety and Constancy in Complex Syntactical Units" (on the basis of the English language) [5] and other authors' works can be good examples to this.

N. Yusifov with M.Pashayeva wrote "A Program in Written and Spoken Speech Practice", R.Huseynova and A. Garayev prepared a thematic dictionary named "Realias of Great Britain", K.Gozalova wrote "Lectures and Successive Exercises in English Lexicology (Semasiology)", "Word-building in English"(in Russian), M.Pashayeva with N.Jamalbeyli wrote "Oral Speech Practice" for the students of third and fourth years, T.Amirova, K.Gozalova, M.Zeynalov and U.Zeynalova wrote "Dialogues in English", V.Arabov wrote "Oral Speech for the third years students", D.Yunusov wrote "A Guide to English Grammar" [6]. They published these textbooks and teaching aids and presented them to the use of public.

During the years of independence to get the textbooks, teaching aids, dictionaries and other specialty literatures became a serious problem that is why the germanists of the republic began their intensive activity because the books got in the previous years were morally and physically rotten. It is enough to look through the list of the books and teaching aids written dealing with Germanistics and imagine which achievement were gained in this field.

The textbooks, teaching aids and methodical publications prepared in the republic meet the demands of the national lecture-room and they are of great importance. A.Garaveliyeva's "English" (for the 1st and 2nd grade pupils in the English bias schools), A.Hajiyeva's "Lectures and exercises in English Lexicology" [7], A.Ismayilov and R.Orujov's "The pronunciation course of the English language", Z.Verdiyeva and J.Akhundov's "Learn English", F.Zeynalov's "Practice book on the English Phonetics", A.Akhundov, F.Zeynalov and S.Babayev's "Rhythmic-melodic characteristics of stress in English and Azerbaijan Languages", F.Zeynalov and A.Mammadova's "Orphophonetic exercises in English", M. Gaziyeva's "Methods of teaching English lexics and phraseology (idioms) in interrelation", H. Guliyev's "Semantic classification of the verb in different system languages (Azerbaijan, Russian, English and German)" [8], L.Suleymanova's "Education-Methodical aid for the development of writing and written speech skills and habits", D.Ismayilova's "Teaching methods of dialogical speech in English for the 1st and 2nd years in the language universities", F.Zeynalov's "Introduction to the English Phonetics and Supplementary to the Practical Phonetics of the English Language" [9], F.Karimova's "The development ways of Oral Speech", G. Yusifov's "The possible ways of translation of the English set-expressions and infinitive constructions into Azerbaijan Language", N. Khankishiyev's "Methodical aid on home-reading for the English faculty students", textbooks, teaching aids and methodical aids established possibilities of teaching Germanistics in our republic on the basis of national textbooks and teaching aids. Lately the number of published works on Germanistics in the republic increased. Nearly all of these books were written to serve the teaching and learning of Germanic languages.

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