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**AKHMED TSEBIEV - A SCIENTIST, INVENTOR AND AUTHOR
OF A SCIENTIFIC DISCOVERY**

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Abstract

Among the scientific results of indigenous nationality representatives of the Chechen Republic to date, there is only one universally recognized achievement of the highest level that influenced the scientific and technological revolution. This discovery is made by A.M. Tsebiev in the group of co-authors. Work on the study of A.M. Tsebieva activity consists of the following stages. The primary collection of material from friends and colleagues who have worked with him in Chechnya, collection and analysis of material from the personal files stored in RA "Istok" archive, the preparation and analysis of materials from the personal files of "Promavtomatika" (Grozny) where he worked in the last years of his life as a leading researcher, as well as obtaining materials from the special migrant's personal file.

This discovery and subsequent research by Soviet scientists in this direction brought the domestic microwave electronics to the forefront in the world and enriched it with new ideas, modern design, technological solutions and unique equipment. According to some reports, this discovery was the precursor of nanoelectronics and nanotechnology emergence. The article is devoted to the description of the scientist biography, his role study in the discovery and in the inventions based on this discovery, his personal life tragedy; the article contains materials that show A.M. Tsebiev personal contribution to science. A list of some of his inventions and some publications in the open press is also given. Some data on the measures to perpetuate the memory of A.M. Tsebieva are also presented.

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1. Introduction

The scientific results of a researcher have varying degrees of significance. Some are aimed at solving narrow problems of an applied nature, others reveal existing theoretical concepts and their application to individual objects. The special status and value has a scientific result, called discovery. The concept of "discovery" and its types are discussed in detail in (Konyushaya, 1999).

The concepts of "invention" and "discovery" are clearly demarcated. The first is a technical solution of the problem, because of which new devices, methods (ways), substances are created, the second is the result of scientific research, revealing previously unknown laws, properties, phenomena.

The highest status has a discovery that is categorized as a phenomenon. Discoveries themselves, and even more related to the category of a phenomenon, are extremely rare. Over the entire period of the USSR existence, only about a hundred was registered.

Science popularization is of paramount importance for ensuring the country self-sufficiency, its independence, and is a necessary condition for the society progress, improving the living standards of citizens, qualitative solutions to emerging problems. The promotion of scientific achievements contributes to the motivation of the younger generation, their involvement in research activities. Propaganda is especially efficient when it is based on the facts that young people can independently "touch". As a rule, these are achievements of scientists from their own region. Especially when the region is under scrutiny due to various events and the widespread view is the absence of scientists with serious results. Therefore, it is extremely important to form a science cult, to attract young people to research work, to promote the scientific results of their region representatives who have conquered peaks in science. Nowadays in the Chechen Republic, the benchmarks of fundamental sciences are the results of Doctors of Sciences as Kh.I. Ibragimov, R.Kh. Dadashev, M.Sh. Israilov and others. A special place among them is occupied by the achievements of Akhmed Magamedovich Tsebiev, who made the discovery of a new phenomenon in a group of scientists in 1959. The available materials show that the decisive role in the breakthrough belongs to A.M. Tsebiev. Article is devoted to his scientific activity.

2. Problem Statement

The scientific results of A.M. Tsebiev, despite their special significance, in the issue of various circumstances confluence, including the overt intrigues of his colleagues on the "Source", did not get a proper assessment in life. His scientific results within his lifetime did not become the property of both the public, even his small homeland - the Chechen Republic, and among physicists and representatives of his nationality. His inventions, scientific articles were not systematized.

3. Research Questions

The subject of this article is to determine the role and place of A.M. Tsebiev scientific results in the achievements of the Chechen Republic scientists, proof of his role priority in the discovery.

4. Purpose of the Study

The objective of the research is to study the scientific heritage and a biography of the physicist, candidate of technical sciences (PhD in Technical Sciences) A.M. Tsebiev, the role and significance of his results for science in general, and for the scientific community of the Chechen Republic, in particular.

5. Research Methods

The analysis of archival material and materials of periodical and special literature on the topic was carried out by general logical methods (analysis, synthesis, deduction etc.).

6. Findings

Ahmed Magamedovich Tsebiev is a man who, during his lifetime, was to become the pride of the nation. But fate decreed otherwise. He is the only one of the “Vainakhs” (Vainakhs is the name of the Chechens and Ingushes) who conquered the Olympus of science, made a scientific discovery of the highest category.

Akhmed Tsebiev was born on January 1, in 1935 in Mahketa village of CHIASSR Vedeno district. Before he started school, the boy could read and write in Arabic. In Makhety he went to the first class of the local school. In 1944, he was already a 4th grade student at the age of 9. He again enters the 4th grade of railway secondary school No at Chu Dzhambulskaya station of Kazakh SSR in 1946, two years after the eviction. 32. In 1951 he graduated from 9 classes of this school, after which the family was evicted again and he moved to K. Marx school of Chulak-Tau village, of Dzhambulskya region. In 1953, he managed to finish high school with a silver medal. Although there is an evidence, that he deserved the gold medal. After the release of the book 2nd edition (Yakubov, 2014) the personal file of the special settler, A.M. Tsebiev was transferred into Archival Administration of the Government of the Chechen Republic. It follows from the case that he, as well as all special settlers who have reached the age of 16, are being monitored. He needs to be regularly noted in the special commandant's office. He, a student who has entered the 10th grade, is arrested for 5 days, for a letter to Moscow, the essence of which is “let me finish school”. In 1953, he was not accepted to the university, because there are no places "for medalists" (from the answer of the selection committee).

He managed to enter the Faculty of Physics and Mathematics of Kazakh State University named after S.M. Kirov in 1954. He studied on “good” and “excellent”. He moved to Rostov State University in 1957. From student memories, according to the stories of his childhood friend S.-A.V. Israilov, who mostly communicated with him, both during and after his studying, Ahmed spent most of his free time in libraries and in the laboratories of the university.

In 1959, an RSU graduate student Akhmed Tsebiev was sent to Fryazino city in Moscow region for pre-diploma practice. He passed it under the guidance of an engineer, A.I. Melnikov. The research topic was closed, therefore the thesis could not be defended publicly. In his gradebook, they simply made an entry on a special subject, its assessment as excellent. Tsebiev received a diploma with honors. By this time, Ahmed was awarded the Diploma of Higher Education Ministry of the USSR for special results in studies and pre-diploma practice.

After graduation, A.M. Tsebiev applied for the research and production enterprise "Istok" as an engineer in 1959. He continues research. In October 1959, A.M. Tsebiev assembled and adjusted the setting where the discovery was made. The discovery of the new phenomenon was made by a group of scientists from the RA "Istok" (a city-forming enterprise, a research institute, then Istok in Fryazino city, Moscow Region), with the defining role of Akhmed Magomedovich Tsebiev, as a documentary proof. *"A previously unknown phenomenon of microwave oscillations generation by a semiconductor diode with one p-n junction at a negative voltage close to breakdown, observed in positive slope region of the current-voltage characteristic of the diode, was established"*.

"The phenomenon of generation and amplification of radio waves using a semiconductor diode was first experimentally discovered in the 3-cm wavelength range as a result of two theses: Tsebiev A.M. "Parametric microwave amplifiers on semiconductor diodes", 1959. (research advisor A.I. Melnikov) and G.P. Kobelkov "Parametric converters on semiconductor diodes", 1960. (research advisor A.S. Tager), made using parametric diodes of IA40I type, developed by V.M. Wald-Perlov. On the basis of the discovery, a pioneering invention of a method for generating and amplifying microwave oscillations using a diode was made" (Tsebiev, 1977).

Official authors of the discovery: A.M. Tsebiev, an engineer with two months experience, A.S. Tager - Candidate of Technical Sciences, the head of the laboratory where the discovery was made, A.I. Melnikov is an engineer with two year experience, and a graduate student G.P. Kobelkov (Tager, Melnikov, Kobelkov & Tsebiev, 1968). The discovery falls into the category where the authorship of the country is not controversial.

There are several versions of the discovery (Yakubov, 2014). In determining the group of authors, the first conflict situation with colleagues occurs. They do not want to let A.M. Tsebiev in the discovery. In the film "A.M. Tsebiev - the Chosen One", his classmate at RSU Yu.M. Noikin, who was at the Istok during this period, said: "I advised him to apply to the party committee". So he was excluded. The result of simply writing a letter to the party committee would not have been the inclusion of A.M. Tsebieva in the list of co-authors of a major discovery, without a significant role, quite the contrary. Others could have written the letter, especially since there is no shortage of people willing to be in the list of authors. Well then, the arguments were weighty.

As it seems the main argument in the letter to the party committee could be precisely the indication that this result had been shown to them earlier. But neither A.I. Melnikov, nor M.B. Golant, nor A.S. Tager, mentioned in his thesis, did not take into consideration the message of Tsebiev. Perhaps, they were not ready for perception. Author's version of the discovery fact is the following:

A.M. Tsebiev encountered with new phenomenon of nature during the graduation work preparation and conducted some research in this direction. Moreover, there is reason to assume that he also reported these experimental results to A.S. Tager. In the thesis draft, found after the death of A.M. Tsebiev, the gratitude to A.S. Tager and M.B. Golant is expressed who are not related to him. Tager might not be ready to evaluate Tsebiev application during that period. The article by V. Reed (Reed, 1958) about the possibility of oscillation generation was published in 1958 and it could unlikely go to Istok at once. G.P. Kobelkov was writing his graduation work, having a specific task and quality assistance in the right place and from the right people.

By the time of conducting the experiments by G.P. Kobelkov, A.S. Tager, perhaps, had already been familiar with the article by V. Reed, and realized that the results were of a serious contribution to science, to one of the most promising areas of physics, particularly in the field of security and country defensive potentialities at that stage of its development. It was obvious that the primacy would belong to the USSR, and the authors would have reason to claim a role in world science.

Neither Melnikov, nor Kobelkov do not speak about any wrong connected diodes, that is the breakthrough version, common among some Istok employees. Kobelkov conducts experiments, obtains and records the results, waiting for the appearance and their evaluation by A.S. Tager.

A.S. Tager realizes that this is the breakthrough. That is what he has already known from the article by V. Reed. But now this result being the breakthrough, at best, belongs to A.S. Tager, A.I. Melnikov, G.P. Kobelkov without A.M. Tsebiev.

With great difficulty we managed to find G.P. Kobelkov, one of the discovery co-author. He claimed to be the first to discover the phenomenon. The role of others is later, at the stage of proving. The communication was characterized by complete amnesia when mentioning A.M. Tsebiev name and a wonderful memory of many small details of that period. Our perennial communication has come down to that the documents, reports, etc. were demanded, if someone thinks otherwise. He admitted that another coauthor - A.I. Melnikov was documentary exposed on this issue. The “document” presented at the personal meeting - a copy of the graduation work, without specifying the author or scientific advisor was rather incriminating information than proof. He did not submit any other documents. His letter is completely presented, without editorial corrections (Yakubov, 2014). Here we use some of its excerpts.

G.P. Kobelkov writes “I did practical graduation training from September 1958 to January 1960, ... From the moment of the generation phenomenon discovery to the first demonstration to A.I. Melnikov, and then to A.S. Tager, about a month has passed, during which I was first looking for “*the interference source*” and then convinced myself that it was a diode that was generating placed in a resonant volume circuit when a certain voltage was applied to the diode”.

Kobelkov indicates “*The experimental setting which I was to conduct the study in, was partially preserved from the previous graduate student*”.

If we allow, namely this conclusion is followed, that the setting still belongs to Tsebiev, then to “his” results Kobelkov, but in September-October 1959, was admitted only as a performer of already existing data. That is to say, Tsebiev could offer him to conduct an experiment to check his data. That could, most likely, was the basis for the inclusion of Tsebiev in the co-authors of the breakthrough. A.M. Tsebiev is included in the co-authors of the pioneering invention on the basis of the discovery (Tager, Melnikov, Kobelkov & Tsebiev, 1966). If his role in the discovery does not exist, then why he was included in the co-authors of the invention that was made on the basis of the given discovery.

All these inconsistencies, documentary data, including video materials, give reason to unequivocally argue that the role of A.M. Tsebiev in the discovery is the main. And this result had been received by him earlier. Another thing is at that time he could not realize it to the full extent of his power. Perhaps the young university graduate was not prepared theoretically, perhaps did not know the technology to resolve such situations. Any other arguments, such as “I was in the room”, “I could also do it”, “I think that I need to be included” at least, are not serious.

He cites the sentence “the discovery was made with my participation” when he appeals to the Central Committee of the CPSU and to other institutions after having problems with the award of Lenin Prize laureateship. It is unlikely that there could be reservations in the documents submitted to the highest instance of the country at that period. The generation of that period remembers very well what the falsehood writing entailed for ordinary citizens. The question with authorship was resolved.

Further, in the period of work in Istok, hard work on the realization of the possibilities of discovery followed. A.M. Tsebiev works with incredible hardworking perseverance and creates a number of inventions listed in the references. In all three inventions mentioned in (Konyushaya, 1999), the surname Tsebiev appears, and besides, in two of them with the sole authorship. At present, the data on 8 issued certificates for inventions are known, more than ten applications for inventions, an application for another discovery and about 80 publications. The following excerpts can be given amongst the results published in (Tsebiev, 1977):

“- generation was detected in 8-mm wavelength range

- the experimental study of capturing oscillations effect of ADO (avalanche-diode oscillator) by an external signal of the main, higher and lower frequencies was carried out and the possibility of creating synchronous multipliers and synchronous frequency dividers on ADO was shown

- a number of new methods, designs and devices on ADO was proposed

- the effect of photoelectric rearrangement of GHPD by a light flux incident on a varactor diode was discovered and investigated”. There are more than 20 conclusions in (Tsebiev, 1977).

“He invented unique designs of oscillators synchronized by an external signal, both at the fundamental frequency and at its harmonics and subharmonics at low powers of the synchronizing signal.

For the first time, generator oscillations at ADO millimeter wavelength range were investigated. To study the spectral composition of the generator harmonics in the millimeter range A.M. Tsebiev offered an original idea of the spectrum analyzer use designed for work in the centimeter range.

Numerous of his works are devoted to the creation and study of frequency multipliers on ADO. The direction development of semiconductor electronics still retains the priority of A.M. Tsebiev works.

His extensive 330 sheets dissertation contains so many great new ideas and solutions”.

In 1977, the work package was submitted for the Lenin Prize - the highest scientific award in the USSR. In Istok, when considering this issue A.M. Tsebiev’s candidacy was rejected by a majority of votes. He turned to the Minister of Electronic Industry, the Committee Chairman on Lenin Prizes, the President of the USSR Academy of Sciences with a letter containing the words “rejection of my candidacy under any pretext is wrong and this work cannot be accepted for consideration ... without A.M. Tsebiev co-authorship”. Tsebiev was included into the candidate staff by the decision of the Board of the Ministry. The work was sent for consideration and reviews to various organizations. Next comes the following. All reviews are positive including a number of academicians of the USSR Academy of Sciences, but there is one review, by MSU professor V.L. Bonch-Bruyevich, which is entitled as “about the work of A.S. Tager, V.M. Wald-Perlov, A.I. Melnikov, Yu.K. Pozhel and A.M. Tsebiev”. There is a sentence in the review “the ponderability of A.M. Tsebiev personal contribution was not completely clear to the reviewer”. The review date is 12/29/1977.

At 01/16/1978 the first work consideration was held at a meeting of radio electronics section, chaired by the academician N. D. Devyatkov and scientific secretary K.I. Palatov. Although a review of V.L. Bonch-Bruyevich took place, there was a sentence in the transcript “Everyone sent very positive reviews, in which achievements and discoveries were noted; it is believed that the priority of creating avalanche-span diodes belongs to the Soviet Union and **this group of authors**. Objections and claims to the author team are absent”.

The work was nominated for the competition.

03/13/1978 the final review of the work took place. The deal touched on A.M. Tsebiev candidacy.

Now the academician N.D. Devyatkov, who was silent during the first review, spoke and uttered the sentence (Yakubov, 2014)

«–“When being discussed at the Scientific and Technical Council, there were speeches that did not characterize him very well. The team does not like him. He is persistent, works a lot ...“. Let us give scans from the meeting protocol of the radio electronics section of the Committee on Lenin and State Prizes in the field of science and technology under the Council of Ministers of the USSR: N.D. Devyatkov finished his speech by words “Nobody wants to work with him and the directorate is taking him to another place. He applied to the Minister and the Board included him in the team, considering that they will figure it out later.”

Next speech was by K.I. Palatov, who had previously said that the priority belonged to “this group of authors”. K.I. Bonch- Bruyevich. – They say that with respect to the first four authors have no doubt, but in regard to Tsebiev and Kobelkov that they are not worthy of the Prize.

Everything is obvious here, because Kobelkov is not mentioned at Bonch-Bruyevich review.

They managed to reject the candidacy of Tsebiev and Kobelkov by means of voting. A.M. Tsebiyev became aware of this in a month, before a few days of the publication of the Resolution of CPSU Central Committee and the Council of Ministers of the USSR in the press. Attempts to change the decision did not give results. This affected A.M. Tsebiev health, who was fired from Istok. In 1983 he returned to Grozny. Next, he worked at Grozny Oil Institute, then at “Promavtomatika”. Here, as follows from A.M. Tsebiev personal file, he connected two computers on a wireless basis in 1986. In 1987 he received a computer class KUVT-86 for the secondary school number 9 in Grozny (a set of educational computing equipment). In 1988, he created a wireless network for these computers. But no one noticed. Everyone saw the failure which took place. Nobody cared about the rise. His candidacy did not gain the necessary number of votes when electing the members of the Academy of Sciences of the Chechen Republic in 1992.

Anyway, he created. In 1989 and 1991 his two books were published (Tsebiev, 1989; Tsebiev, 1991). These books include programs compiled by him that have provided significant assistance to teachers in the absence conditions of elementary methodological support for teaching computer science in schools of the republic. It seems to be essential to mention one of the nearly two hundred programs of the book - “Moscow Nights”, which allows you to sing the famous song using only software.

In 1994, he published a solar prayer calendar for the latitudes of the Chechen Republic (Tsebiev, 1994).

During the second military campaign in Chechnya, A.M. Tsebiev refuses to leave Grozny and dies by the hands of an unknown scum. He was buried in the cemetery of Staraya Sunzha in Grozny. The article

in (Shcherbak, 2016) is devoted to A.M. Tsebiev tragedy. School No. 9 in Grozny was named after him, where a wireless network was functioning in 1988.

The story is not written in the subjunctive mood. But we would like to say “What if ...”

If he had been given the opportunity to study at school and there was no eviction of nations?

If he had been given a gold medal at school?

If he had the opportunity to go to college in the first year of graduation?

If conditions had been created for him, but not obstacles?

.....
If he had been awarded the Lenin Prize?

If he had been elected to the Academy of Sciences of the Chechen Republic?

What if...

These “what if ...” could fill out the article.
.....

7. Conclusion

Reasonable arguments about the priority of A.M. Tsebieva role in one of the major discoveries of the twentieth century in the field of semiconductor electronics are given. A.M. Tsebiev works of theoretical nature and applied orientation are systematized.

References

- Konyushaya, Yu.P. (1999). “*Discoveries of Soviet Scientists*”, Moscow, Moscow State University named after Lomonosov.
- Reed, W.T. (1958). A high-frequency negative resistance diode proposal, *Bell system Technical Journal*, 37, 2, 401.
- Shcherbak, V.P. (2016). *37 tragedies science. Biographies of scientists*. Publishing Solutions.
- Tager, A.S., Melnikov, A.I., Kobelkov, G.P., Tsebiev, A.M. (1968). Generation and amplification of centimeter and millimeter wave radio waves using a semiconductor diode. Diploma for the opening number 24. Priority 27.10.59. *Bulletin of inventions*, 13.
- Tager, A.S., Melnikov, A.I., Kobelkov, G.P., Tsebiev, A.M. (1966). The method of generation and amplification of microwave oscillations using a semiconductor diode. Author's certificate number 185965, priority 10.27.1959. *Bulletin inventions*, 18.
- Tsebiev, A.M. (1989). *Collection of practical lessons on programming*. Chechen-Ingush Book Publishing.
- Tsebiev, A.M. (1977). “The complex of theoretical and experimental studies of the generation and amplification of electromagnetic oscillations of ultrahigh frequencies with avalanche ionization in semiconductors and the creation of a new class of semiconductor devices - avalanche-transit diodes”, *Ministry of Electronic Industry of the USSR*, 1, 2.
- Tsebiev, A.M. (1991). *Collection of practical classes on programming. 2nd edition, revised and enlarged*. Grozny, Grozny Worker Publishing House.
- Tsebiev, A.M., Goytemirov, R.U., Mataev, A. (1994). *Solar-prayer calendar of the ChRI for 1994*. Grozny, Chechen-Ingush book publishing house.
- Yakubov, A.V. (2014). *Akhmed Tsebiev. Olympus and Calvary scientist*. Nalchik, Printing House.