

# TARNOW'S NEWS



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## *They saved London*

*V-2 Rocket Hitler's secret weapon gets to the British Islands thanks to a coordinated action of Tarnów's people, members of the intelligence service of the Armia Krajowa (National Army - the dominant Polish resistance movement in World War II in German-occupied Poland, with over 300 000 members). With knowledge on how the rockets were build, Allies were able to effectively defend themselves.*

### *What was "Bridge III"*

Bridge III was a nickname for an operation during which parts of the V-2 rocket were transported from Poland to England. In order to accomplish this task an allied plane had to land in occupied Poland. Fields by Wal Ruda near Tarnów were selected for this purpose. The airfield was nicknamed "the butterfly" by the National Army. On the 29<sup>th</sup> of May 1944, operation Bridge II took place there. That is why, when orders to repeat the landing, came down from London, AK headquarters in Warsaw decided to go on with the operation in the same place. This area was easy for a pilot to navigate at night, because the Wisła river could be easily seen. Not far from there, to the east, Wisła joins with Dunajec and from the west a large strip of forest ran from the river to the train tracks of the Kraków Tarnów line. Landing of the Dakota plane, which flew from Italy (Brindisi) was supposed to take place at the beginning of July 1944. In the end AK soldiers had to wait for almost 2 weeks. In that time the whole operation complicated very much. Mainly because of heavy rain and a German division that set itself up no more than a kilometer away from the field. Finally the landing took place at night from the 25<sup>th</sup> to the 26<sup>th</sup> of July.

### *Dramatic Operation*

*Airlift of the gathered V-2 rocket parts had a very dramatic process. Second in command of the whole action was Zdzisław Baszak. Here is how he described preparations for the operation in his book "Operation 3<sup>rd</sup> Bridge".*

(...) After arriving, in a short time everything was organized: guard forces, communication, living quarters and reserves.

Guests started to arrive and the underestimated mail started to arrive as well. The readiness level to accept the plane was reached very quickly. That is how the days of anticipation begun, hard, troublesome and dangerous for the successful outcome of this very risky and unusual operation. A rainy season came to be and a rain that lasted a few days softened the landing area. Softened fields were useless for landing and time, which was working against us was dragging. It seemed that there will be no end to the aggravating wait. Messengers were going back and forth, radio kept informing that the plane will not start, because "Włodek" responsible for accepting the plane knows that the plane could land but takeoff is not certain because of soggy terrain. So we waited.



*Team of partisans from the Tarnów region.*

Finally it stopped raining and the sun came out, however the fields were wet and soggy, and partially covered in water. We keep waiting. Time passes, nerves keep us on the edge, twenty days of July pass, how much longer will we have to wait?

I was personally responsible for receiving and loading of people and equipment. Under my direct control were a sabotage section from Przybysławice, as well as the guard forces, and most importantly the reserves and I had no idea whatsoever about crossing the Wisła river.

I knew very well that the ability to cross the river was minimal. Hidden fishing boat, that could take up to 2 people, was no way to cross the river and with people who did not know how to operate it a swim in the river was almost certain. Alarming the detachments was my deputy's, first lieutenant Mieczysław Skrzeka's job. He picked the time, password and countersign. All of the troop movements were conducted in total silence with every possible precaution taken. Smoking, flashlights and talking were all forbidden. A constant silence was in effect. The end of the operation came 20 minutes after the plane left. When we waited for the flight, which was for almost 2 weeks, which we were in no way able to predict, different obstacles and complications arose. These put the command under great pressure (...).

At first something went wrong in Brindisi, later it rained here in Poland. With time pressure escalated, however worst surprises waited for us at the end of the wait. Around the 20<sup>th</sup> of July, Hungarian plane crashed near the Budzowa village, which was right next to my 2nd quarters. It was damaged over the nearby frontlines. The crew died and there was almost nothing left of it to collect. Right after this incident, we did not have time to have a sigh of relief when "our airfield" was used by German planes. They started landing and taking off. This took us completely by surprise. We started to think what to do with the planes, should we disperse them or maybe destroy them. Finally when it was almost agreed that we will move them aside during landing or destroy them on the night of the 24<sup>th</sup> they left.

Finally on the 25<sup>th</sup> of July radio operator "Gapa" received a signal from Brindisi that on that afternoon a plane will take off. This message put everybody on alert. ALARM finally we'll get this thing over with and will go on a deserved rest, because we were tired and we were fed up with everything. In the meantime a messenger from the village of Wal-Ruda came into our quarters and informed us that a German detachment with a searchlight and an antiaircraft cannons came into the village. Dramatic havoc, confusion and command's total astonishment.



What now? How to accomplish the mission? What to do??? We thought of changing the landing airfield but this was not pursued. Time flew by, finally after receiving a message that the Germans are tired, wondering around the school and are not displaying any signs of readiness, nor are they interested in anything in particular and are not taking up their positions, we decided not to change our plans and only got ready to fight back eventual attack. Night was clear and quiet, and most importantly dark. The feeling of excitement, uncertainty of what will the next few hours bring stayed in your mind for a very long time. Everywhere around us silence, all you could hear were the frogs croaking and dogs barking, darkness everywhere. Blackout was in effect.

I drove to the landing site, road was barely visible, will I find the bridge on the Kisielin river? Carriage wobbles from side to side, I hope it won't fall over. You can't hear the wheels, because the road is soft, I frequently drive on grass and all you can hear is the heavy breathing of the horses. I make it to the landing site with help of a man from the diversion section, who's sitting next to me.

For the last, short part of the journey we go on foot. After several minutes a message comes in that human shields are in position. I gather the security in one place, departing "Guests" are waiting beside us, you can feel the tension, everybody is nervous will they come or won't they. Pressure escalates with every minute. We feel most at ease together, old diversion group, we check our weapons, we fix the heavy ammunition, this helps the mood. When everybody is nervous, this calms me down. Somebody has to think straight. Finally around midnight, we can hear from the distance on a large altitude a totally different sound, we don't recognize it, of an incoming plane. This must be them, and they are coming from an expected direction. In a few minutes "Wlodek" who's responsible for guiding the plane joins the operation. He knows the signals, manages the airfield crew, sets up the position lights the direction and the landing. I almost don't notice it, I'm looking at the incoming machine. Up to this point it was perfectly silent and dark, after a few moments everything changes radically. Lights on the ground are lit, signals are given plane's positional lights are turned on, finally it starts to get closer and quickly descends, makes a terrible sound and turns on terribly strong guiding lights. For almost 3 years, working on different assignments, I live at night and sleep during the day, I am shocked by what is happening. I almost scream: "Turn off those deadly lights and quiet down your machine". But this only lasts a moment. Pilot notices that he is too high, turns off the lights and picks up the machine and flies away, making a couple of kilometers long arch. In a few moments the situation repeats itself, night turns into day. Silhouettes of people running from under the plane look funny. Finally it touches down, rolls on the grass, turns against the wind and turns off the lights and the engine. Silence, but only for a moment. Doors open, quickly the arrived get off and a young man appears in the door, and .... in polish he gives commands on what has to be loaded and in what order: couriers, mail and then the "Guests". For a moment that made me think, but there was no time for that.

First, when picking up the mail I had an "accident". Received small packages I handed over to the head of diversion section "Kmicie". Suddenly, when he put his hand in his pocket, a relatively small explosion (double barrel shot) took place. It ripped part of his pocket, some fire and something blew up in the air. "Kmicie" froze for a moment, surprised by the explosion. He burned his leg. He screamed, put his hands in his other pockets, filled with similar packages, wanting to get rid of them. I stood near by, with similar packages in one of my hands, last ones I think. Thinking that he might want to get rid of a very valuable shipment I reacted on instinct. I pressed my Colt (10.45) which was hanging around my neck, to his chest and gave him an order "Calm Down". We waited for a minute, nothing more exploded so I issued another order "keep your hands away from your pockets", we'll get rid of this stuff in a few minutes. We placed, with great care, these little exploding packages, along with other mail on a carriage.

Loading and unloading lasted only maybe 3-5 minutes, we were in a hurry. We wanted to get rid of these long awaited "guests". Troubled, I looked to the south, where around 100 well armed and with search lights Germans were stationed. Everything ready, thud of the closing doors and a signal to take off. Engines start, terrible roar lights, engines turning to maximum revolutions, strong thrust behind the plane and the back of the plane starts to pick up and after a short moment lights turn off rapidly and the engines go silent. Everybody is completely stunned. A terrible silence falls.

What happened? Doors open up and a polish pilot, Mr. Kazimierz Szrajter (I learned his name long time later), announces, to everybody's surprise that the breaks are jammed and they will not be able to fly away. This took us all by surprise. We all realize the coming danger. Maybe not everybody thought about it, but those responsible for the shipment and the people knew exactly what awaits them. Lieutenant Pawel Chwała picked up those people that arrived and he head to quickly escort them through the Zaborów woods, to a train in Brzesko. This was a relatively easy assignment, but what to do with those that are staying, with the mail, to which we did not pay any special interest, and most of all what to do with the plane? The pilot dispersed any doubts that we might have had, BURN IT. Near the machine I had a section of 10 well armed people, and about a kilometer from the forest "Jawor" stood with a platoon of 36 people, I could also count on 30-50 people, fairly well armed. There wasn't that much ammunition to go around. Instant calculation, we're not going to make it. We have to save the plane or we're all going to die. We start again, 2 3 times. Passengers get on and off, finally a decision comes, there is no help we have to burn it. In 1939, when I was in school on a cadet training in Kraków they used to take us to the 2<sup>nd</sup> air regiment. There they showed us beautiful machine guns and cannons which were a part of standard equipment on a "Karas" I think. Now I was thinking that this plane must be equipped with similar weapons. These have to be taken off the plane, at least we'll have something to fight with, they won't get us that easily. I get inside and ask the pilot where are his guns and cannons? Let's go take them out. To my complete surprise, he stated that he has no such weapons on board, all he has is a revolver and a full clip of ammunition. That made me feel sick, half conscious I look at something that reminded me of a barrel very big I ask what is it? Gasoline, he replied calmly. I have no idea how much of it was there but it must have been at least 1000 l. This woke me up instantaneously, this was the deciding moment. I knew one thing, they have to fly away, we cannot burn the plane.

I think that till this very day local villagers are not fully aware of what sort of danger they were in. A terrible explosion, German raids Gestapo total destruction, burned down houses and many killed. This area already had a bad opinion with Gestapo, about a 100 people ran away from the Wietrzychowice commune, there were dead bodies in Ładowniki. I don't remember the details. According to "Brzechwa" St. Wróbel noticed that the wheels were stuck and there was no movement when the plane tried to move. I know that I was furious, knowing what awaits myself and everybody else, I got scared, I was cold, although the temperature was around +20°C.

We started to dig the wheels out. We dug with our hands, somebody had a shovel. When a space of about 1 meter was dug out and beat down I remembered that there were planks on the carriage. We immediately brought one. We placed it under a wheel, however it stood out too high, and there was some danger that it might have damaged the propellers. We broke it in half and placed the other part under the second wheel. Mail, people and everything that was taken off was loaded up again, this took only a few seconds.

There was no need to hurry people up. The crew behaved a little bit passively, they were not aware of their situation and mostly the situation of the local population. They would be protected by the Geneva convention, people they didn't think about and Mr. Szrajter with delight looked ahead into the future, thinking about interesting partisan adventures in Poland. One more start, roar, lights and the wheels started to turn, moving on the broken boards. The plane started to move and didn't get stuck.

The plane, to our delight, started slowly to pick up speed and it lifted off the ground and flew away. This must have been one of the happiest moments in my life, at that time. The most important thing is this, the plane flew away, delivered to England a thing which the crew of the "Butterfly" had no idea about, saved people in a far away England and nobody during the "3<sup>rd</sup> Bridge" died. This was the thing that we paid most attention to. This was our assignment at the time and it would also be our biggest failure if the operation did not succeed. After a few hours we found out that the plane landed in sunny Italy. We did not need to know anything more at that time. I don't remember when we found out what the shipment contained, that "They saved London".

*At a certain time a lot was said on the subject here in Poland, in UK probably nothing. History of the V-2 operation, so well described by Mr. Michal Wojewódzki shared the fate of the Enigma.*

Dakota



### What was the V-2 ?

V-2 (Vergeltungswaffe-2, retaliation weapon nr 2) was a first ballistic rocket constructed by a team of German developers, under the guidance of Werner von Braun. First trials were conducted in 1942, and the mass production started in 1943. In 1944 Germans used the V-2 rocket to bomb London, Antwerp and Brussels. Work on improving the rocket was conducted on the military training grounds in Pustków-Blizna near Tarnów. In 1944 soldiers from the National Army's intelligence (AK) were able to collect rocket fragments which came from a rocket that exploded over a military training ground near Sanok.

#### Technical data on the V-2:

Length 14.03 m

Weight of the rocket ready for takeoff 12963 - 13000 Kg

Weight of the explosive charge 975 Kg

Speed of the rocket from 2900 5500 km/h

Range 320-380 Km



V2

### Enigma - The history of breaking the German coding machine

**Enigma** - German coding machine, used by intelligence and German Army, decoded by Polish intelligence.

Enigma was created in Germany by Hugo Koch, who sold patents to it to an engineer Arthur Scheribus. German navy began using the Enigma machine already in 1926. Several years later it came into use on land. It served as a basis for the Japanese Purple Code.

#### History of breaking the Enigma

At the end of the XIX and at the beginning of the XX century most of the known codes in cryptology and those used in the real world worked on the principle of substitution. These codes do not hide the statistical properties of the language used to write unsecured messages, for example the relevant frequency of appearance of letters such as e,a,z etc.... As a result, in the age before the wide spread use of mechanical coding machines the main role in cryptanalysis was given to linguists. The French, English as well as Poles tried to break the Enigma codes as far back as the end of 1920's, however without any results. These problems were mainly due to the fact of using polyalphabetical codes in the enigma machines, in which each letter of the unsecured text is coded with a different alphabetical permutation. This allows the sender to hide the linguistic properties of the text. At that time, management of the Code Department of the II Branch (military intelligence) of the General Headquarters, hired professional mathematicians.



In 1929 a course on cryptology was organized for mathematical students from the Poznań University (they were sent there by prof. Zdzisław Krygowski, from that University). Marian Rejewski, Jerzy Różycki and Henryk Zygalski joined the program. At the end on September 1932 Rejewski started to work on the Enigma. Meanwhile, western powers strongly believed that the Enigma code cannot be broken and almost entirely stooped working on breaking the code.

The main problem was an inability to generate, basing only on the knowledge of the principle guiding the coding process and the coded message, a deciphering key which would allow to decode sent messages. Soon after Rejewski, other two mathematicians Zygalski and Różycki joined the project, only to finally break the Enigma code in December of 1932.

First Polish copy of the German Enigma Machine was created in 1933 in the "AVA" factory. Work on the machine was directed by engineer Antoni Palluth (one of the lecturers from the before mentioned cryptography course). From that time on, Poles were able to read German correspondence, it wasn't easy however. Germans kept changing the machine and the ways used to cipher messages. Poles developed an extremely effective methods of deciphering Enigma's codes. In order to accomplish this task they employed, in a very innovative way, existing combination theories of cycles and transpositions: A mechanism called "the bomb" was constructed for that purpose. It deciphered coded messages by searching through possible keys basing on the cycles theory. It is worth mentioning that this was an amazing achievement for that time because a purely electro-mechanical process, without employing any electronics, was used.

Obvious mistakes of the German side, such as repetition of the coded key in every message as its first 6 entrees, were widely exploited. Coding messages was based on using a code book in order to attain initial keys for the given day. These were later used to code a repeated key used to code, picked at random, messages for a given transmission. If an abc key was picked, then the beginning of the message, before coding, would look like this: abcabc.... Thanks to a mathematical method developed by Polish experts, this was enough to break the codes, as long as a certain amount of coded messages was available, which were, under normal conditions, available after 2 to 3 hours.



*Enigma ciphering machine*

In 1939 Germans changed their system of coding messages and stopped transmitting repeated coded keys at the beginning of each coded message. This created a situation in which further deciphering required expansion of "the bomb" deciphering machines by tens of modules or listening to more messages, which was not very practical. Cost of such operation was higher than the total budget of this intelligence unit. In this situation, on the 25<sup>th</sup> of July 1939 in Pyry near Warsaw, in the headquarters of the Codes Department, a meeting with emissaries from allied nations was held. Two Enigma Machines were handed over to the French and the English along with deciphering materials. Nonetheless Poles did not forgo their trials to decipher even with their financial and organizational problems.

They were able to improve mathematical methods enough to be able to read enemy's messages with some extra work and by using larger amounts of material gathered through monitoring.

After the war begun, team of Polish cryptologists, similarly to the high command, left Poland through Romania. Thanks to some maneuvering and cleverness, members of the team very able to escape from Romania and get through to France, where they continued their deciphering. With help of pre war contacts in the French command, the team of cryptologists could count on delivery of messages sent by the enemy, and after the invasion of France and empowerment of the Vichy Regime they were able to continue their work. This complicated situation could not last long and after half a year the team had to be on the run again. With help of forged documents and they got through to Algeria and from there to Great Britain at the end of 1941.

*Enigma ciphering machine*



Because the origins of the materials deciphered by Poles were kept a secret and all other materials concerning the Enigma machine were classified as top secret in Great Britain, materials published on the topic of breaking the Enigma codes, even at the end of the 1960's, distorted the truth. It was thought that the Enigma codes were never broken and later on the whole credit was given to the English, especially Turing. Keeping these facts a secret was caused by a fact that during the years of the cold war the Enigma machine was used and distributed by the British government as a ciphering machine for diplomats in the third world countries. By keeping the fact of breaking the Enigma Codes a secret, British intelligence and other western nations were able to access information, including diplomatic mail, of those nations which bought the Enigma coding machines.

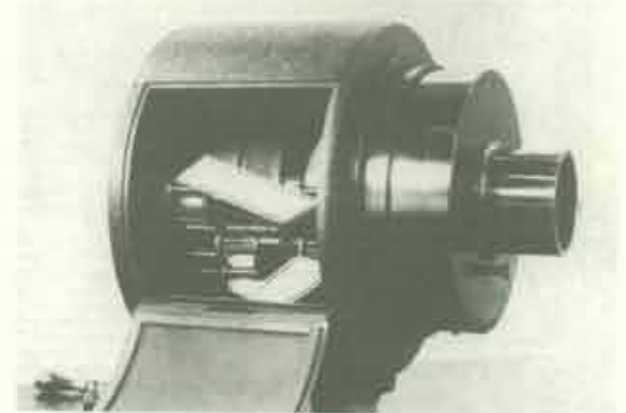
Deciphering machines which were constructed in Bletchley Park (Great Britain), were created basing on the materials received from Polish specialists. In 2002, in Bletchley Park museum a plaque commemorating Marian Rejewski, Jerzy Różycki and Henryk Zygalski was placed.



## Jan Szczepanik -Polish Edison



**Jan Szczepanik** (April 13, 1872 in Rudniki - April 18, 1926 in Tarnów, Poland) was a Polish inventor. He held several hundred patents and made over 50 discoveries, many of which are still used today, especially in motion picture industry, photography and television. Because of the amount of the invention and its importance he is being called "Polish Edison".



*Camera designed by Szczepanik*

Most of his interests focused on two fields textile and photography. Before World War I, Szczepanik carried out experiments with photography and image projection, as well as with small format color film. He holds patents for a new weaving method, a system of obtaining tri-color photography rasters and equipment for sound recording and playback. Following the discoverer's idea, Agfa corporation produced its Agfacolor reversible paper; color films were also made for the first time, projecting 24 frames per second. Szczepanik's more significant discoveries include also colorimeter - a color control tool, an electric rifle and a color image weaving method, together with the automation of their production.



Some of the ideas influenced the development of television, such as telectroscope (apparatus for tele-reproduction of images and sound using electricity) or the wireless telegraph, which greatly influenced the development of telecommunications.

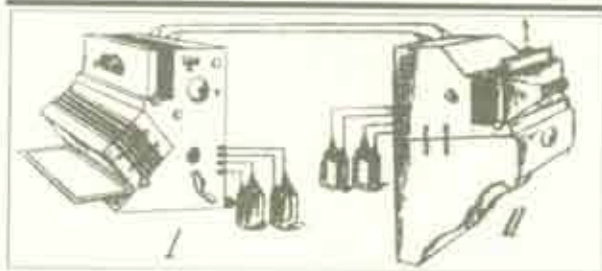


diagram of a working TV transmitter

His works with textile resulted in new inventions that allows to perform complicated patterns on textile with lower cost and much faster than before (with his method it took several hours instead of several days to get final textile). He has also invented bullet-proof fabric, thanks to that he was granted awards by royal courts. Spanish ruler Alfonso XIII awarded him an order for creating a bullet-proof fabric, which saves his life during one of the assassination attempt. Austria-Hungarian emperor Franz Josef I relieved him from the mandatory military service, and, fascinated with a photosculptor (apparatus for copying sculptures), gave him a pair of pistols as a souvenir.



trial of a bulletproof vest

However Szczepanik spend most his life in Tarnów, where he has his laboratory in which one of the first color photography was taken, he was well known in those days. Mark Twain claims to be Szczepanik's friend and he had written a novel based on the Szczepanik's inventions. Jan Szczepanik has died in Tarnow April 18<sup>th</sup> 1926 after a long and hard cancer dieses. Year 2006 according to Tarnow's City Council announcement is in Tarnow a Year of Jan Szczepanik "Polish Edison".

## Tarnów Industrial Luster "Plastics Valley" S.A.

Ever since 1929, when the Tarnów Nitrogen Works opened, Tarnów has been considered one of the leaders of chemical industry in Poland. Presence of such a strong company was utilized in the 1990's when an idea of an industrial cluster was born. Tarnów Industrial Cluster Plastics Valley S.A. was set up in 1999, with an aim of creating conditions which would allow enterprises, focused on plastics processing, to locate and thrive in Tarnów by utilizing strengths of the local economy and a system of national and local tax incentives.

### Main functions of the Plastics Valley are:

- ~ make use of a specialized, skilled workforce;
  - ~ take part in the economic promotion of the Tarnów region as a centre for the plastics industry;
  - ~ create a plastics lobby (interest group).
- ~ providing technical, financial, legal and organizational advice;
  - ~ operation of a 'one-stop-shop' for investors (to overcome bureaucratic barriers to entry);
  - ~ real estate sales, rent and management;
  - ~ giving assistance in obtaining equipment and materials for production;
  - ~ providing specialist training courses;
  - ~ providing help in promotional activities and marketing.

Additional advantage of investing in Tarnów is a close proximity of Tarnów Nitrogen Works and thus a possibility of purchasing a wide range of raw materials for production.

### Companies in the Tarnów Industrial Cluster are able to:

- ~ obtain special corporate tax rebates (Special Economic Zone);
- ~ obtain a 5-year local tax holiday, inexpensive production space, services and management
- ~ reduce production costs ('just in time' deliveries of raw materials, lower transport costs);
- ~ have access to R&D facilities and new technology;

Tarnów Industrial Cluster "Plastics Valley" manages 21 ha of prime investment space in the Krakow Special Economic Zone, sub zone Tarnów. Currently, work on expanding the zone in Tarnów is underway.



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