

SANITARY CONDITIONS IN THE AUSTRO-HUNGARIAN WAR HARBOUR POLA (PULA, CROATIA) IN 1916-17: FOUNDATION OF THE HYGIENIC INSTITUTE

SANITARNE PRILIKE U AUSTRO-UGARSKOJ RATNOJ LUCI PULA (POLA) TIJEKOM 1916. – 1917.: OSNIVANJE HIGIJENSKOG INSTITUTA

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SUMMARY

Since 1850 the town of Pola (today Pula, Croatia) underwent big changes and growth due to its transformation into the principal military port of Austrian-Hungarian Empire. Besides the Admiralty that governed the naval actions, the harbor was supported by different organizations needed for normal functioning of the harbor. One of this organizations was Naval Technical Committee (Marine Technisches Komitee), founded in 1874 with the purpose of solving the technical and technological issues related to the navy. The outbreak of World War I (WWI) posed new challenges for Europe. Thus, on February 29th 1916, the Hygienic Institute was founded in the harbor area and Dr. Karl Cafasso was appointed as the first director. The purpose of the Institute was to provide scientific and professional aid to the Head of the Medical Corps of the Ports' Board (Kriegs-Hafenkommando) in the field of epidemiology, microbiology, social medicine and hygiene, the main fields of public health even today. By the end of the war, the Institute ceased its activity, and similar was founded only in 1938, under Italian rule and has been developed to the present Institute of Public Health.

Key words: World War I; Hygienic Institute; Pula (Pola); sanitary conditions.

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INTRODUCTION

Looking for archive documents on I&R naval Academy in Fiume (now Rijeka) from the boxes containing documents from Presidial office of the Navy (Präsidialkanzlei der Marinesektion-PK), i.e. the daily orders released by the Admiralty in Pola (Pula), I found documents about the foundation of the Hygienic Institute, an institution unknown to today's generations. This paper is entirely written on the basis of these orders for two war years: 1916 and 1917 (PK, 1916, 1917).

The small town of Pola (today Pula, Croatia) underwent big changes and growth since 1850, and was transformed in principal military port of Austrian-Hungarian Empire (Fig. 1). Besides the Admiralty that governed the naval actions, the harbor was supported by different organizations needed for normal functioning of the harbor. One of these organizations was the Naval Technical Committee (Marine Technisches Komitee), founded in 1874 with the purpose of solving the technical and technological issues related to the navy. The outbreak of World War I (WWI) posed new challenges for Europe. The Red Cross was engaged in establishing new hospitals required to cure wounded soldiers coming from the front. In addition, on February 29th 1916, with the Emperor's Decree the Hygienic Institute was founded in the harbor area and Dr. Karl Cafasso was appointed as a director. The

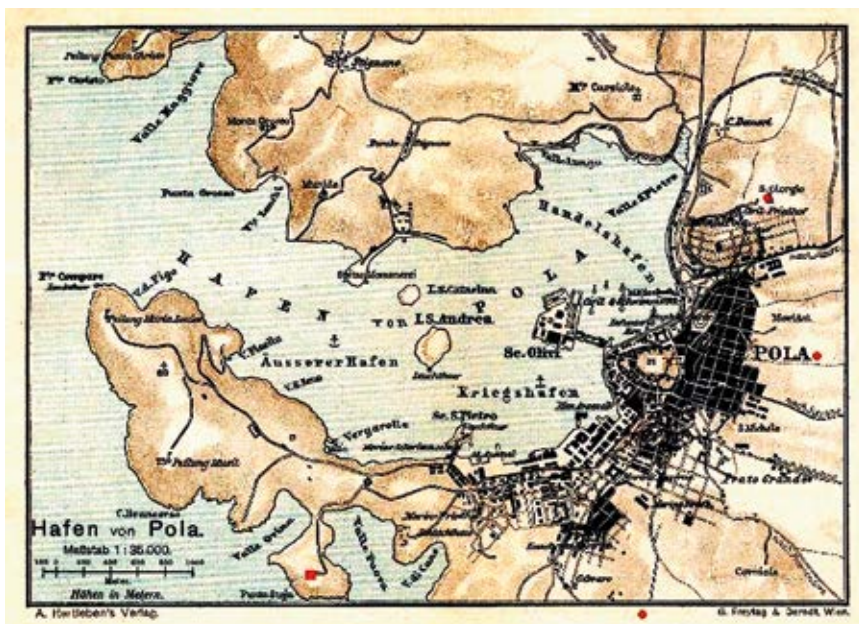


Figure 1: The port of Pola (Pula) at the beginning of the 20th century

purpose of the Institute was to provide scientific and professional aid to the Head of the Medical Corps of the Ports' Board (Kriegs-Hafenkommando). The tasks of the Institute were:

- the application of professional standards in general hygienic issues
- undertaking the professional investigation
- a control of potable water distribution within the war harbor, in collaboration with the Office for coastal construction (Marine. Land und Wasserbeamt)

The Institute itself was located at the infantry barracks at the Festungsspital 4, while it was administrative bound to the Festungsspital 2 (HT, No. 60, 29/02/1916).

The question was, what was the Festungsspital? The search for this word in German dictionaries did not help, and even a query sent to Austrian colleagues involved in history research. Though, there are still available for sale postcards sent from different Festungsspital during the World War I (WWI), including the one located in Pola (Fig. 2). Analyzing the word itself, it could be translated as Fortress hospital, i.e. hospitals founded during war times. Having in mind that Pola was surrounded with numerous fortresses (Festungs) built from Venetian to Austro-Hungarian times, one can assume that these locations were used for extended medical and sanitary needs during wartime. In fact, there existed 16 fortifications in Pola and its surroundings forming 16 fortification areas, from the coast to the island



Figure 2: Postcard with the seal of Festungsspital 3 located in Pola (Pula)



Figure 3: Fortress areas (Festungsrayon) surrounding the war harbor Pola (Pula) during the WWI

Brioni and to the inland towards Dignano (today Vodnjan), as given in Fig. 3. If this were true, the war hospital would be located in the area of fortress Punta Christo (Festung II area, Fig. 4), and the newly established Hygienic Institute in the neighboring Monte Casteliere (Festung IV area, Fig. 5). These are only assumptions that need further confirmation. Indications for the above statements are the call of the Regular Sanitary Commission (Ständige Sanitätskommission), published on August 7th 1914, in daily news “Polar Tagblatt” (1914), with the authority to take over and use some of the land, private or public buildings, in particular fortress’ area (Festungsrayon) for sanitary purposes. The Commission was antecedent to the later founded



Figure 4: Fortress Punta Christo located in the II fortress area (Festung II), where war hospital should be located (<http://www.istria-culture.com/de/entdecke-s45?g=3>)



Figure 5: Fortress Castelliere, in which surrounding Hygienic Institute was located (http://ipd-ssi.hr/?page_id=1318)

Hygienic Institute with the same tasks: implementing food control, controlling prostitution and spreading of infectious diseases, and executing disinfection where necessary.

INFECTIOUS DISEASES CONTROL

One of the first measures in preventing the spread of infectious diseases was destruction of mosquito larvae in standing waters (ponds, drainage channels, septic tanks) in the area of 1000 m from the residence (Ubistazion) using the so-called "petrolization" process (HT, No. 84, 24/03/1916). The process was mandatory from April 1st, at least once a week, particularly after rainy days for standing waters surfaces – using ¼ l of petroleum for m² of the water surface. For this purpose could have been used cheaper, non-refined petroleum, which could have been possible to obtain in the Arsenal's storehouse.

The Institute's task was also to fight against malaria. The preventive action should have begun on April 1st, and was supposed to last for the next three months. Every person that suffered from malaria in the last, or in the few earlier years should have taken every day (a drink) an acidic solution of quinine (0,4 g). The quinine was delivered in a form of pill from respective sanitary officials and should have been taken in their presence. The necessary quinine pills were ordered by respective naval physicians and were available in the naval pharmacy. In the case of the professional transfer to other location, the patients on preventive therapy should have been provided with enough quinine tablets, and respective documentation stated: "Preventive treatment of malaria should be carried until 1916 with number of quinine pills, one per day, to the utmost. The finished and unfinished therapies should be inscribed in the Health record of the Register book." The order ended with the recommendation: "Persons who suffered from malaria last year are highly recommended to undertake therapy with quinine for few months."

Port Admiralty released the order (No. 94, 03/04/1916) that people, including troupes, clerks, and authorities, coming from areas with registered infectious diseases, such as smallpox, cholera, spotted fever, as well as arriving on ships should be in the quarantine. Those arriving by train were directed immediately to the quarantine. Since spring 1916, the weekly reports on the spread of infectious diseases in Istria, Fiume (Rijeka) and the parts of Slovenia and Dalmatia were carried on. As a result, areas with registered infectious diseases were forbidden to visit. From these lists it is possible to reconstruct the epidemics of infectious diseases during wartime.

The fight against infectious diseases comprised also bacteriological control of kitchen and its personnel starting in summer 1916 (HT, No. 191, 09/07/1916). All cooks and personnel working in kitchens and bakeries in military troops, clerks and ships were called for bacteriological tests on typhus, paratyphus and dysentery. For a new employment in kitchen or bakery, prior to the start of a work, was necessary to pass the bacteriological examination of the stools (the same principle is applied today, for employment in the food industry). Samples of stools were taken by physicians, and delivered to the Hygienic Institute. The Institute provided the necessary sample containers. The containers were numbered, and provided with the personal data list (name, profession, rank). In order to avoid overcrowding with samples, it was recommended to announce the action to the Institute.

Disinfection of parcels was introduced by the end of 1916 due to the spread of infectious diseases (HT, No. 331, 26/11/1916). Such parcels were signed as "Disinfected". Only sanitary secure parcels were not necessary to disinfect, but should have been labeled as "Not disinfected, clean".

In the following year of war appeared a shortage of disinfection matter containing fat soap (Fettseife-haltige Desinfektionsmittel), and its use was allowed only in the case when no substitution was available, i.e. for disinfection of body and underwear. In any case, these substances were forbidden for disinfection of furniture, pavements and toilets. Solution of triol (2-5%), available at Naval pharmacy, could have been used for this purpose instead (HT, No. 8, 08/01/1917).

The aggravation of sanitary conditions resulted in outbreak of infectious diseases, including trachoma. Therefore, obligatory registration of patients with trachoma treated in the hospital was introduced. The register should have contained data on service, rank, military unit, date of joining the navy, duration of stay in the hospital and data on the hospital itself (HT, No. 280, 07/10/1917).

VACCINATION

Infectious disease outbreak promoted vaccination as a preventive action. By the Order No. 32 (HT, Act. 3, 01/02/1917) vaccination against typhoid fever was prescribed. The military personnel, public servants (state officers), and civil drivers were obliged to vaccinate with a new vaccine, using the following protocol:

Day 1: 1 cm³ vaccine against typhoid fever, and day 7. 2 cm³ of vaccine (vaccine had to be shaken before application). Personnel exempted from the

vaccination were: clerks, staff without rank, subjects. Vaccination was carried out every Wednesday and Saturday since 3 PM in the annex of the Naval Hospital. As the vaccine was packed in larger packages, it was advised that the vaccination should be performed in groups of 20 persons.

In the wartime women took over a lot of functions in the Arsenal. For this reason, women were obliged (HT, No. 214, 02/08/1917) to vaccinate against smallpox. Vaccination against typhoid fever was recommended to women who had never been vaccinated before, or not in the last 7 months. Timetable and order for vaccination should have been in accordance with the Health insurance of the navy.

The number of women employed in the navy must have been enormous, since women inspectors were employed (HT, 29/12/1917). Every department with approx. 500 women should have had one women inspector with the task to:

- Collaborate in every occasion where women are engaged as auxiliary force
- Pay visit to all formations where women are engaged and make sure if they are adequate for the job, as well as their physical and psychological conditions
- Specific women outfit should be provided in military troops where women are engaged
- Should harmonize actions with commander to keep the contracts
- Accept complaints and provide legal advice to women where needed
- Deliver to higher command all warnings and claims

SEXUAL DISEASES CONTROL

Prostitution was legal in the Austro-Hungarian Empire and the prostitutes were obliged to pass medical exams and take preventive measures against sexual diseases. One of the actions undertaken by the sanitary services of Admiralty, including the Hygienic Institute, was fighting sexual diseases (HT, No. 205, 23/07/1916). As noticed by the sanitary team, a prophylactic agent (Borovaseline and mercury cyanate solution, 1:3000) was available in every room of the brothel, but it was rarely used in spite of girls being warned to offer them to every visitor. Therefore, an order was given that every visitor must use the prophylactic agent. The report states: "During their visit, the medical team warned men several times about the dangers and consequences of sexual diseases, and that increased number of infections among girls are the result of neglecting physicians' orders. Before

sexual intercourse the visitor had to check-up the medical booklet of the girl to prove her name. Men should be punished, if they are not able to name the girl from whom they were infected." Before leaving the war harbor area to visit the brothel, men were warned to use prophylactics. The instructions in four languages for their use were displayed in every room. The same warning was used when leaving for vacations (HT, No. 318, 13/11/1916). Some theater performances were also played for military staff, friends and admiralty, such as one called "The shipwreck", with the some scope of warning from the danger of sexual diseases. It is interesting to note the objection "The price is the same as for operetta performances" (Information, 03/05/1917). It seems that all these actions were not successful since the orders for the following month (HT, No. 188, 30/06/1917) prescribed that brothels should have been signed with boards, and their rooms had to bear numbers.

SOCIO-MEDICAL ISSUES

Some social questions rose due to longer than expected duration of war. From the available documentation (HR, No. 66, 29/05/1916), it turned out that statistical data indicated a decline in a number of newborns. For this reason, it was advised to send younger soldiers more often home for vacation, as well as to issue wedding permits. The soldiers received 2 weeks of vacation after spending 6 months on front, while for those who were not on front, the same period was awarded after 9 months of services.

The longer duration of the war obviously caused a higher rate of alcohol abuse. Therefore, the Admiralty took over the order No. 172 (21/06/1915) for obligatory medical examination of persons who were found drunk. The physicians had to check-up 1. a reaction of pupils to strong light; 2. stage of orientation loss, and 3. behavior of a drunken person (frightened, biased, or aggressive) and strange body movements. The physician was obliged to write a report and expertize whether "the person was aware of his condition or totally drunk", and the severity of punishment was chosen based on this report.

SANITARY CONTROL OF FOOD

The longer duration of the war caused problems with food supply, and therefore some provisions were undertaken. Thus, at the end of 1916 (HT, No. 337, 02/12/1916) the slaughter of calves was forbidden in Istria and a punishment for either a seller or a buyer was foreseen. Slaughter of calves could be done only by a special permission by the authority. Food shortage

could also be a reason for taking measures against violation of the Law on food, either because of adulteration or selling contaminated goods. That was the reason that a black list of 60 food providers was made (HR, No. 24, 10/02/1916), among them even the person working in the canteen of the k. u k. Naval Command, from whom it was forbidden to purchase food.

Lack of sanitary safe food resulted in recommendations given by the authorities on how to use unsafe food. Thus, order No. 33 delivered on May 13th 1917 (HT) gave advices how to prepare pork with light infection of tapeworms, based on experiences from the local population who used such infected pork meat without harmful effects on their health. In order to avoid food loss, and based on existing civil regulations and veterinary experience, the given recommendations were:

- Under supervisions of veterinarian or physician, pork meat lightly infected by tapeworms should be cut in pieces under 0,5 kg of weight and 15 cm of thickness. Such pieces of meat should be cooked at least 3,5h. Pieces of meat for drying should not exceed 0,5 kg by weight, and should be soaked into souse for three weeks. Such cooked or salted meat should be safe for human nutrition.
- Pork meat highly contaminated with tapeworms could not be used for human nutrition and could have been used for technical goals (fat collecting for soap production). The use of fat (bacon, bowels, and belly fat without meat) had no restrictions.

As the war continued, some fresh vegetables were replaced by dried, but this step caused some complaints among the population. Therefore, in Order No. 298 (HT, 25/10/1917) the commission valuated dried vegetables as suitable for human nutrition and could not have caused colitis. The recommendations given in the same document was to wash dried vegetables from the remaining soil, leave overnight soaked in cold water, then splash it with warm water to eliminate dead larvae, and finally to cook it.

Because of the scarce food supply, the Admiralty in the new order (HT, No. 303, 30/10/1917) gave procedure how to use frozen and rotting potatoes for human or animal food. No doubt, the procedure is very interesting:

1. Rotting potatoes were separated from the healthy, washed, soaked in solution of calcium carbonate (1 kg in 30 l water) and mixed from time to time. Subsequent to taking them out and washing with cold water, potatoes could be used for nutrition. If potatoes were not suitable for the diet, they were mixed with warm water and used as animal feed (for

pigs and cattle). Potatoes were used as animal feed only in the case that the bad smell was too intensive to prevent eating. The CaCO_3 solution could have been used as long as it did not overtake the bad smell. (The procedure was based on neutralization of small organic acid with bad smell generated by aerobic degradation of potatoes, ob. author)

2. It was forbidden to expose frozen potatoes in the fresh air. The best way of keeping potatoes was to soak them in the cold water, so that their surface was covered. After taking over water and washing, the potatoes could have been used for nutrition. Frozen potatoes left in the air, because of its sweetness, could have been used as animal feed.

In order to avoid spoilage of otherwise insufficient quantities of food, the Admiralty gave instructions how to keep potatoes in a kind of a “shelter” built for these purposes (HT, No. 303, Annex, 09/11/1917). The potatoes were put on a dry soil covered with wooden grid and were covered by layers of wooden grid, double straw and soil layers forming a triangle structure, to keep the constant temperature, but leaving enough fresh air circulating to avoid anaerobic degradation (Fig. 6). In the case of very low temperature, the inner triangle aperture would be closed to avoid freezing.

ALTERNATIVE NUTRITION AND FOOD USE

The third year of the war started with rationing of bread (HT, No. 23, 23/01/1917), with daily allowance being: 480g – lower dose, 530g – higher dose and 660g – special dose. The lower dose was aimed to office staff, servants, keepers of horses, hospital staff, post office, steam laundry, railway station, Naval Technical Committee, fire brigade, and all women employees. The higher dose was delivered to sailors’ troops, naval battalion, troops belonging to engineering school, and younger persons not excluded from the list of lower dose. The special dose was aimed for commanders of naval corps, commanders of naval battalion and commanders of engineering school, who kept 5% of daily allowance for those who really needed it (very young and convalescent). The difference between the doses of 660g and 530g or 480g should have been paid in money. The rationalization was extended to other food in daily allowances (HT, No. 27, 27/01/1917), and the lack of money was resolved by introducing new taxes: on higher income (HT, No. 12, 01/01/1917), on dogs (HT, No. 15, 15/01/1917), and mail packages (HT, No. 28, 29/01/1917).

Food shortage led to alternative choices in nutrition. Thus, nettle leaves were suggested for vegetables and food (HT, No. 203, 22/07/1917). After

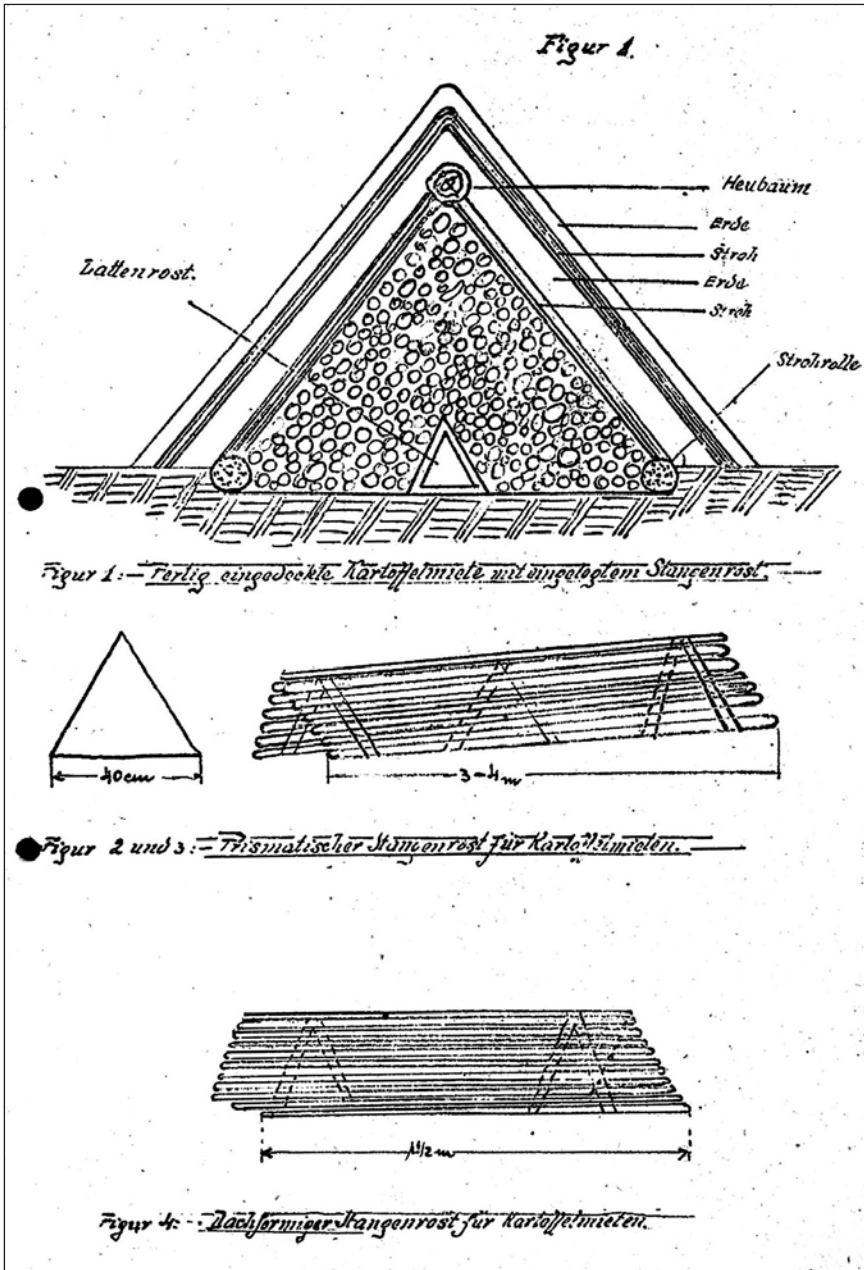


Figure 6: Instructions for keeping potatoes to avoid spoiling. The potatoes were put on dry soil covered with wooden grid (Fig.1) and covered by layers of wooden grid (Fig. 2, 3 and 4), double straw and soil layers forming a triangle structure, to keep the constant temperature, but leaving enough fresh air circulating to avoid anaerobic degradation.

blanching, the nettle leaves could have been prepared as spinach, or with boiled potatoes. Fresh green leaves could have been used for nutrition, while older could have been used as animal food.

With prolonged time of war, the food supply got more difficult, and the daily allowances were often changed. For the same reason, the Admiralty started to grow vegetables. Thus, with order No. 132 (HT, Information, 12/05/1917) employees were informed that the vegetables grown up in the military garden would be available for purchase, even for the unused quota for grease, but this exchange should have been announced.

From the daily orders of the Admiralty (HT, No. 257, 14/09/1917), it is clear that the olives were cultivated in the area of Naval authority and were used for nutrition following the recommendations:

- to keep them at the naval area in order to fulfill the navy's needs for oil
- the olive harvest started in November, with personal staff taking part in order to diminish the olive loss
- should have taken care that olives were healthy and complete, and were collected in baskets or bags for bread. The daily collected quantity was sufficient for 25l of olive oil.
- in the absence of available oil press, the olives were packed in boxes and transferred to Dignano (now Vodnjan). Olives should not remain in boxes longer than 24 hours.

Naval officer responsible for supply supervised the pressing of olives, and he also provided the necessary boxes. Quantity of unused olive residues had to be declared by the end of November.

In the increasing shortage of various goods, Order No. 68 (HT, 09/03/1917) suggested collecting of coffee remains, drying and sending them to Oil and Grease Center in Vienna that paid 16 Kr/100 kg (for unknown reason).

MEDICAL EDUCATION IN WARTIME

During the wartime, the Naval hospital and the Hygienic Institute continued with the education of staff in new circumstances. The Admiralty order No. 296 (HT, 22/10/1916) announced for October 24th 1916 at 3 PM at the Hygienic Institute a lecture of military physician Dr. Kurtz on malaria and its treatment. Physicians, sanitary officers, and naval cadets were invited to attend the lecture.

The war circumstances have introduced new topics for lectures. Thus, two lectures were announced for March 23rd and 24th 1917 at 3 PM at the

Hygienic Institute (HT, No. 75, 17/03/1917). The topics were Gas as combat devices, Protection from combat gas, and Treatment of wounds caused by combat gas. The lecturers were a physician on the battleship Dr. Vecsei and Dr. Erdelyi, a higher physician. Among those invited to the lectures were, besides already mentioned, candidates to naval physicians. Similar lecture under the title: "Treatment of wounds caused by combat gases" was held by a higher naval physician, Dr. Marzell Rožanowski, half a year later (HT, Art. 4, 09/12/1917) in the Naval hospital. In spite of war, education of physicians continued, as evident from the order No. 83 (HT, 24/03/1917), where candidates for naval physicians were informed about the courses of Infectious diseases and their control. The courses were planned to be held on Mondays and Thursdays at 2:30-3:30 PM in the Naval hospital. Another important issue of the wartime was elaborated in the lecture: Water supply of war ports with demonstration, held by a higher headquarters physician, Prof.dr.sc. Wilhem Presnitz (HT, No. 155, 04/06/1917).

At the end, it became evident from these daily orders that so-called *summer time* was already introduced in 1917, more precisely on the night of April 15th and 16th 1917 and lasted until the night of September 16th and 17th 1917.

CONCLUSION

The Institute ceased its activity by the end of the WWI, after which this area was annexed to the Kingdom of Italy. The new institution of public health in Pula was founded only in 1938, with the main scope to fight tuberculosis that was widespread in these new annexed areas, but the institute also had a laboratory diagnostics. After WWII, the area passed to Yugoslav control, and this institution was incorporated in 1947 into Sanitary-epidemiologic station. Finally, in 1956 the Hygienic Institute was founded, with the activities similar to those of the first Hygienic Institute, dealing with epidemiology, microbiology and public hygiene. After several reorganizations and incorporating social and school medicine, since 1994 this institution is known as the Institute of Public Health of the Istrian County, following the new regional structure in the independent Republic of Croatia. (www.zzjziz.hr, 2017)

Comparing with the similar Teaching Institute of Public Health in Rijeka, which is a successor of the Royal Chemical Laboratory founded in 1900 with the task to analyze the food (Alebić-Juretić, 2001), the Hygienic Institute in Pula started 16 years later, but with wider and almost complete activity like today's public health institutions.

The laboratory in Rijeka worked constantly, during and after WWI, and was transferred to regional preventive medicine institution by Italian law in 1927 (Laboratorio provinciale d'igiene e profilassi), with similar tasks as the Institute in Pula founded 11 years later. Both institutions followed the same fate after the WWII, when these territories became a part of Yugoslavia, and subsequently of the Republic of Croatia (Alebić-Juretić, 2001). Though, this early Hygienic Institute was forgotten.

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SAŽETAK

Pula je tijekom druge polovice XIX. stoljeća doživjela velik procvat nakon stacioniranja ratne luke K.u.K. mornarice. Vojnom lukom, kao i zaposlenim službenicima i časnicima, upravljao je Admiralitet. Uz pomoračka i vojna zanimanja za potrebe mornarice, za posebna je tehnička pitanja osnovan već 1874. Mornarički tehnički komitet (Marine Technisches Komitee), a tijekom Prvoga svjetskog rata, 29. veljače 1916., osnovan je i Higijenski institut ratne luke Pula, za čijeg je voditelja imenovan dr. Karl Cafasso. Institut je trebao djelovati kao znanstveno-tehnička pomoć šefu saniteta Uprave ratne luke (Kriegshafencommando), a administrativno je bio vezan za vojnu bolnicu (Festungsspital 2.) Zadaća instituta bila je stručna primjena u pitanjima opće higijene, preuzimanje stručnih ispitivanja, djelovanje i borba protiv zaraznih bolesti te kontrola opskrbe pitkom vodom u području ratne luke, a vezano uz ovaj zadnji cilj služba za izgradnju priobalja (Marine-Land und Wasserbeamte) i uprava Instituta morali su surađivati. Iz spisa Predsjedničkog ureda, koji se čuvaju u Ratnom arhivu (Kriegsarchiv) u Beču, vidljivo je da je planirana aktivnost Instituta ostvarena, uz realizaciju i nekih drugih aktivnosti poput borbe protiv širenja spolnih bolesti, bakteriološke kontrole osoblja i pribora kuhinje, provedbe cijepljenja te uništavanje ličinka komaraca tzv. petrolizacijom u svrhu borbe protiv zaraznih bolesti, znanstvenog i stručnog usavršavanja putem predavanja na Institutu te, shodno ratnim prilikama, savjetodavne uloge za korištenje sanitarno neispravnih namirnica za ljudsku prehranu, kao i uzgoj povrća na vlastitom terenu u uvjetima smanjene opskrbe namirnicama u trećoj godini rata. Završetkom rata Institut je prestao raditi, a iduća ustanova sličnog djelovanja uspostavljena je za talijanske vladavine 1938., da bi od 1947. nastavila put od Sanitarno-epidemiološke stanice u Jugoslaviji do današnjeg Zavoda za javno zdravstvo Istarske županije.

Ključne riječi: Prvi svjetski rat; higijenski institut; Pula (Pola); sanitarni uvjeti.