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Depicting the Greek communities in “Smyrna Zone”, Asia Minor at the beginning of 20th century (1919 – 1922), combining historical maps with textual data

Keywords: G.I.S, historical maps, textual data, homogenization of cartographic data, thematic cartography

Summary: Rare historical maps and textual data from different sources, combined together in a proper way, can provide a picture of the past in a region with special interest. The aim of this project is the study and the promotion of the Greek communities on the west coast of Asia Minor at the beginning of 20th century (1919-1922), when the Greek presence in the area was ended due to the Treaty of Lausanne (1923). The study is based on historical maps depicting the area at that time and on textual data and descriptions which provide information about the history of these communities, their population, their educational system and the organization of the Metropolises in that zone. All this information is combined to each other, in order to create a map depicting the Greek communities in the “Smyrna Zone” and their development at the time from the Occupation of Smyrna by Greek forces in 1919, until the Great Fire and Smyrna’s catastrophe in 1922. The final product is the Map of Hellenism in “Smyrna Zone” at the beginning of the 20th century (1919 - 1922) in scale 1:250.000.

Introduction

Historical maps are an important part of our cultural heritage and a valuable source of historical data associated with specific periods in the past. For this reason, it is widely used by researchers from various disciplines studying changes in the area through time or collecting information for a place at specific time periods (Boutoura and Livieratos, 1986, 2006; Boutoura et al, 2011; Livieratos, 2006; Tsorlini et al, 2010, 2017). On the other hand, there are historical textual data and information about places, during important historical facts, which are not depicted extensively on maps. A geographical region with great interest is Asia Minor, where the first Greek tribes were settled from ancient times. Over the centuries, the largest centres of Hellenism were formed in the area of Pontus and the west coast of Asia Minor. After the end of the First World War, according to the Treaty of Sevres (10.8.1920), the region of Izmir, “Smyrna Zone”, would be governed by a Greek High Commissioner for five years to protect the Greek population living in and around the city, and then, it could be part of Greece after public vote. Three years later, the Treaty of Lausanne (24.7.1923) was

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1 Metropolis here is used as an ecclesiastical administrative division, where settlements were under the control of the seat of the metropolitan church.
signed ending the Greek-Turkish conflict and moving the surviving Greek population away from its roots due to the obligatory population exchange.

In this paper, the information which was collected from historical textual sources and descriptions as well as from historical maps is combined to each other (Tsorlini et al., 2018), in order to create a map depicting the Greek communities in “Smyrna Zone” from the Occupation of Smyrna by the Greek forces in 1919, authorized by the winning forces of World War I to implement the Armistice of Mudros\(^2\) in the area, until Smyrna’s Great Fire and its Catastrophe in 1922. Apart from the Greek communities and the statistical information collected about them, the map will also depict the archaeological sites, the ecclesiastical centres and the educational institutions, which played an important role for Greeks in that region.

Each step of the procedure is demanding and challenging for various reasons, especially because data from different sources and in different forms should be combined and visualized properly on the map. The same time, the result which shows how the area looked like a century ago, when the population consisted of more than forty percent Greeks, is also very interesting and can be used for further analysis or research.

**Methodology**

The basic steps of the process followed in this study, were:

a. the data collection from different historical sources, their cross-checking and the evaluation of their accuracy,

b. the development of a geographic information system, where all this information (historical maps and textual data) is organized and visualized through its georeference and digitization and finally,

c. the designing of a map, where all this information is depicted and presented based on cartographic and aesthetic rules, making the map easily readable and communicative in a comprehensive and interesting way.

**Data collection: historical maps, textual data**

Data collection is the most important and time-consuming process, because it requires research on different media and organizations. In this project, searching for data was extremely difficult, since it refers to the past and it is not depicted to a unique map. Almost all levels of information came from historical maps and from personal research into rare historical texts located in specialized libraries. These data were collected, organized in a database, evaluated for their precision and presented below.

**Historical maps**

For a better understanding of this area a century ago, it was necessary to find maps which can provide useful information about it (Livieratos, 2009). One of these maps is the historical map designed by

\(^2\) The agreement to end hostilities between the Allied Powers of World War I (Entente Powers), including Greece and the Ottoman Empire (See Nikolaou C. 1996. *International Treaties and Conventions*, Athens, pp. 257-258).
Heinrich Kiepert in 1890, entitled “Specialkarte vom westlichen Kleinasien” (Fig.1). The map consists of fifteen sheets, in scale 1:250000, six of which cover the area of interest. The information which is collected by Kiepert’s map refers to the settlements, the road and railway networks, the capes, the islands and bays, the ancient settlements, as well as the names of rivers, lakes and mountains.

Apart from this map, another map used in this study is Alfred Philippson's map entitled “Topographische Karte des westlichen Kleinasien”. The map in scale 1:300000 is dated in 1910 and depicts

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3 University of Chicago, Digital Library [https://www.lib.uchicago.edu]
the southern part of the area of interest (Fig. 2). Its content was studied and compared to Kiepert's map, in order to check its accuracy.

Figure 2. Topographische Karte des westlichen Kleinasien, Alfred Philipppson, 1910.
(Source: Beinecke Library, University of Yale).

The borders of “Smyrna Zone” were a subject of great concern, since there were differences between the available historical maps. The historical map of Hellenic Military Geographical Service, dated in 1997, in scale 1:1500000, depicting the Greek State and its expansions from 1832 until today (Fig. 3) was considered the most reliable to take information about the borders, not only for Smyrna Zone but also for the Greek-Turkish borders.

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4 The historical map was collected from the department of rare books and manuscripts in Beinecke Library, University of Yale (https://beinecke.library.yale.edu).
Historical textual data

The study is focused on the Greek communities of the Smyrna Zone, which lived there a century ago in an organized society, both at religious and educational level. In order to find information about this area at this particular time period, it was necessary to search in different sources in order to cross-check the information and conclude to reliable results. The collected information refers to population data of the Greek settlements, statistical data for the education of Greeks and the existed Greek schools in the area, as well as data concerning the Metropolises and metropolitan churches, the monuments and ancient historical sites and the topography of the area at that time.

Greek settlements – Population data

Concerning the Greek settlements of Smyrna, our data are based on the registration\(^5\) of all the cities, towns and villages inside the zone defined by the Treaty of Sevres with their population by ethnicity\(^6\).

\(^{5}\) Notaras M. 1972. The book was found and photocopied in the Library of the Society for Macedonian Studies (E.M.S).

\(^{6}\) See Notaras M. 1972, p.11. The exact text was: «Περί τά μέσα τοῦ 1921, ἡ Διοίκησις Ἑλληνικῆς Διοικήσεως Σμύρνης ἔλαβεν ἀπὸ τὸν Ὄψανον Ἀρμοστήν τὴν ἐντολὴν νὰ προβῇ, ἀνευ οἰκονομικῆς θορυβού, εἰς τὴν καταγραφὴν ὅλων τῶν οίκισμῶν (πόλεων, κοιμοπόλεων καὶ χωρίων), ποὺ ὑπήρχον ἐντὸς τῆς Συνθήκης τῶν Σεβρῶν καθοριζομένης ζώνης, καὶ εἰς τὴν ἐξακρίβωσιν τοῦ πραγματικοῦ, κατ’ ἐθνότητας, πληθυσμοῦ ἐκάστου ἐξ αὐτῶν». 
The registration was conducted in the middle of 1921 by the Greek Administration Office of Smyrna, under the command of the High Commissioner. This census was the only official registration by the Greek administration and it is referred to the settlements which have Greek residents. It also presents in detail the distribution of the settlements’ population in each kaza according to their ethnicity (Greeks, Turks, etc.).

Education

The education of the young Greeks was the main concern of the Greek administration. This fact is evident by the numbers of Greek schools in “Smyrna Zone”. During 1913-1914, there were 172 schools; during 1918-1919, the schools were 104 and during 1921-1922, 237 (Michailidis-Nouaros, 1955). The collected information concerns the number of schools that operated in 1921-1922, the number of students by gender and the teachers, as well as the classes existed in each school. In addition, data were collected for the areas outside the “Smyrna Zone” within the military occupied zone in Asia Minor (Notaras, 1972). This information is coming from the official data signed by the Inspector of Education and it is regarded to be reliable for the purpose of our study, since it could not be crossed checked from other sources.

Religion

Religion was very important for Greek communities in both the city of Smyrna and the smaller centres of Hellenism. An effort was made to gather as much information as possible from different sources, about the name of each church and the Saint, to whom it was dedicated. Information about the existence of the church was equally important, even when the name of the church could not be found. Information concerning the Metropolises and the settlements belonging to them the period before the Asia Minor Disaster was collected from their seats. Moreover, information referring to the “Seven Churches of the Apocalypse”, was found and included in our database, since six of these churches were located in “Smyrna Zone”.

Ancient civilization and monuments

From the late 12th to the end of the 9th century BC, the Greek tribes moved from the barren and mountainous regions of mainland Greece to the lowland and fertile land of the Greek skeleton, the Aegean

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7 This is also confirmed by the fact that although Greece was in the middle of difficult military operations, which attracted the State’s attention and resources, the development of any sector of civilization was not neglected. The exact text: «Λέγεται συνήθως καὶ εἰναι ὁρθὸν ὅτι “inter arma silent artes” -ἐν πολέμῳ σιγοῦ αἱ Τέχναι. Καὶ ὁμος ἡ Ἑλλάς ἐν μέσῳ πολεμικῶν δεινῶν ἐπιχειρήσεων, ποὺ ἀπετρόφων κατ’ ἀνάγκην ὁλη τὴν προσοχὴν τοῦ Κράτους καὶ τοὺς ὠλικοὺς πόρους του, δὲν παρημέλησε κανένα τομέα τοῦ πολιτισμοῦ.» (Michailidis-Nouaros, 1955, p.72).

8 See “Xenophanes: a journal magazine of the Asia Minor Association”, vol. 2,3,4, 1904-1906

9 The Seven Churches of the Apocalypse, usually known as Seven Churches of Revelation or the Seven Churches of Asia, are seven major churches of Early Christianity, as mentioned in the New Testament Book of Revelation. All of them are located in the Asia Minor. According to Revelation 1:11, on the Greek island of Patmos, Jesus Christ instructs John of Patmos to write on a scroll what he sees and send it to the seven churches (communities with Christians), namely Ephesus, Smyrna, Pergamum, Thyatira, Sardis, Philadelphia and Laodicea (Kirtaras 1994).
islands and the coasts of Asia Minor. Aeolians, Ionians and Dorians crossed the eastern Aegean Sea and settled in certain geographical units, the boundaries of which were not always stable. A typical example is Smyrna, which from an Aeolian colony, very early, was conquered by Ionians\(^{10}\). The wider area of the western coasts of Asia Minor is full of important cities (e.g. Ephesus, Pergamos) which were inhabited by different tribes (Aeolians, Ionians, Lydians etc.). The collected information in this case concerns the ancient cities and the tribes settled in them. Additionally, data were collected about monuments, fortresses or castles, most of which were constructed during the Byzantine Empire.

*Topography*

The area has an interesting natural morphology consisting of important mountain ranges, historical peninsulas and bays. Its hydrographic network is also worth exploring for both its extent and its historical significance (e.g. Pactolus River). Information concerning the names of the natural characteristics of the wider area (mountains, rivers, lakes etc.) has been also gathered (Kontogiannis, 1921) and utilized appropriately in the next step of our work.

**Data Processing, Organization and Management through a GIS**

The next step, after the collection of data from various sources, was the development of a Geographic Information System (G.I.S), where all information could be organized, managed and visualized through the system, on maps. For this reason, important step of the procedure was the georeference of the historical maps and the digitization of the appropriate features depicted on them.

*Georeferencing historical maps*

The historical maps were the main source of information, since they were designed and produced some years before the period of interest. The collected maps were studied and georeferenced properly (Fig. 4), so that they can be digitally analysed.

The historical maps of Kiepert\(^{11}\) and Philippson\(^{12}\) were georeferenced to a graticule in UTM projection, zone 35, with central meridian on 27 degrees using the European Datum ED50. The historical map produced by Hellenic Military Geographical Service\(^{13}\), due to the lack of graticule, was adjusted to the modern background using as control points common characteristic points of the area.

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\(^{11}\) Specialkarte vom westlichen Kleinasien, Heinrich Kiepert, 1890, downloaded from University of Chicago Library (Fig. 1).

\(^{12}\) Topographische Karte des westlichen Kleinasien, Alfred Philippson, 1910, downloaded from Beinecke Library, University of Yale (Fig. 2).

\(^{13}\) Historical map of Greece, Hellenic Military Geographical Service (HMGS), 1997, downloaded from the HMGS’ website (http://web.gys.gr) (Fig. 3).
Figure 4. Philipsons’s map georeferenced to the graticule, using as control points its intersections.

**Digitisation**

The collected information (historical maps, textual data) was organized on a database and then, connected to the Geographic Information System (GIS), where spatial information was available. The data were then transformed into a common reference system, in order to achieve their homogenization, which will help to its correct visualization on the map.

**Geometric information**

The new map’s geometric features are based on the georeferenced historical maps. More specifically, the Greek-Turkish borders and the boundaries of “Smyrna Zone” were digitized from the historical map of Hellenic Military Geographical Service. Road, railway and hydrographic networks (rivers and lakes) were digitized from Kiepert’s and Philippson’s maps, as well as the cities of Smyrna and Magnesia, which were symbolized as areas because of their large population. Attention was given to the depiction of all the settlements with Greek inhabitants belonging to the same kaza at that period, on the new map. Concerning the settlements with Turkish inhabitants, they were depicted on the map to complete the correct representation of the area.
For the third dimension on the map, a digital elevation model (DEM) of 30m resolution, downloaded from the USGS\textsuperscript{14} was used to produce a coloured and a hillshaded relief. The two products were combined using digital transparency to produce the relief of the map. Furthermore, contour lines with an interval of 150m were extracted from the DEM to complete the visualization of the map’s relief. Concerning the bathymetry of the area, data were downloaded from the Hellenic Centre for Marine Research (HCMR)\textsuperscript{15} and used to depict the bathymetry of the area and to complete the background of the map.

\textit{Thematic information}

The settlements are the basic level of information on the map. It is important to mention that for the settlements in which at least one Greek resident was recorded at the census of 1921, (Fig. 5), both the Greek and the Turkish toponym were included in the database and depicted on the map. The digitization of the settlements was based on Kiepert’s sheets and it was also checked using OpenStreetMap in the cases where the name remained the same until now. Information was found also for the total population of each settlement and separately, for the population of Greek residents. Based on this information, every settlement was characterized as purely Greek, with a Greek majority or with a Greek minority. The purely Turkish settlements were also included on the map and they were mostly villages, since the towns and the big cities were inhabited by Greeks and they are symbolized according to the census of 1921.

Moreover, information was collected for each settlement concerning the \textit{Metropolis}, on which it belonged, the number of the churches in their area and the names of the most important of them. The main problem was the detection of some settlements on the historical maps of Kiepert and Philippson.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline
\textbf{Name} & \textbf{Population} & \textbf{Greek_Pop} & \textbf{TurkeyName} & \textbf{Percentage} & \textbf{Metropolis} & \textbf{CurrentMet} & \textbf{Num.Church} & \textbf{Amount.Chu} \\
\hline
0 & Καβαλάκης & 20000 & 20000 & Αγιάση & Pure & Καβαλάκης & Αγιάση & 11 \\
1 & Μπαχανή & 5000 & 5000 & Μπαχανή & Pure & Μπαχανή & Αλλο Ασπρόμαυρο & 6 \\
2 & Πετραχαρία & 2500 & 2500 & Πετραχαρία & Pure & Κουμάνη & Κουμάνη & 1 \\
3 & Παγκατσί & 450 & 100 & Παγκατσί & Minority & Κουμάνης & Υμά Μανάμης & 1 \\
4 & Πετράκη & 1400 & 800 & Πετράκη & Majority & Κουμάνης & Κουμάνη & 1 \\
5 & Καραγιάννη & 1140 & 340 & Καραγιάννη & Minority & Παράδεισο και ΑΔ... Καραγιάννη & 1 \\
6 & Καζιμιρί & 350 & 150 & Καζιμιρί & Minority & Κουμάνης & Κουμάνη & 0 \\
7 & Πελέτια & 655 & 50 & Πελέτια & Minority & - & Πελέτια & 0 \\
\hline
\end{tabular}
\caption{Data concerning the name and the population of the settlements located in the kaza of Ayvalik, the Metropolis they belong to and the most important churches existed on them.}
\end{table}

Information concerning the education on these settlements during the school year 1921-22, which is the year before the Asia Minor Catastrophe, is included in the database (Fig. 6) and it concerns the name of the school (mainly the high schools) if it was known, its location, the year of its foundation, the number of classes and finally, the total number of its students and their gender.

\begin{itemize}
\item[15] Hellenic Centre for Marine Research (HCMR), http://arch.her.hcmr.gr/downl.html
\end{itemize}
Figure 6. Data extracted from the database concerning the high schools existed in the area just before the Asia Minor Catastrophe.

For the digitized ancient settlements, the information refers to the name of the settlement, the tribes which lived there through time and the settlement’s categorization based on its importance and size in antiquity (large or small settlements). Additionally, the most important castles of the wider region were digitized (Fig. 7), including the name of each castle, the historical period during which it was constructed and the location where it was situated.

Finally, the digitization of the most important mountains located within and around the “Smyrna Zone”, their names in Greek and Turkish, their altitude, as well as the names of bays, capes, islands and ports were also collected and inserted in the database.
Map designing

The next step of the procedure is to visualize all these data on a map, in an attempt to show the development of Greek communities in “Smyrna Zone” at the beginning of 20th century, through their population and their educational and religious organization.

In order to create this map, it is necessary to follow specific rules for map design and production (Boutoura, 2015; Livieratos, 1989; Tsorlini, 2017), so that the final result would depict the area correctly and would be easily readable by the public. The map was designed using the Universal Transverse Mercator projection with the central meridian on 27 degrees, which passes almost from the centre of the area. The designed map is in scale 1: 250.000 and its dimensions are 89.1 x 84 cm, a practical size which can be folded to A4. In order the map to get its final form, the basic step of this procedure is the definition of the proper typology and symbology of the geometric and thematic features of the map, as well as the editing of the map, which should be done in such way that all the characteristics are easily readable.

Symbolization and depiction

For the visualization of settlements categorized according to their population, we have used the detailed census of each settlement (Notaras 1972). Categorizing the population helps the map reader to understand better the population sizes as well as their ethnological distribution. In particular, the size of the circle represents the population of the settlement, while its colour indicates the ethnological distribution of its inhabitants. With dark blue, we have visualized the purely Greek settlements; with light blue, those with Greek majority; with light red, those with Greek minority; and with red, the purely Turkish settlements. The same practice was also applied to the cities of Smyrna and Magnesia which were depicted with an area symbol.

Two categories of symbols were created to represent the education infrastructure of this area. The first one concerns the secondary education, which was divided into High Schools and Semi-High Schools/Urban Schools, while the second one refers to the primary education and it is divided into two categories; the schools in which less than 400 students were enrolled and those with over 400 students. In this way, it is possible to get an idea of the school’s size. It is noteworthy that most of the schools, especially in the larger centres of each kaza were separated to schools for male and female students. This information was not included and visualized on this map, at least for this study.

The most important cities of the ancient world were depicted with a different symbol, distinguishing them from the smaller cities. Also, each symbol contains the initial letter of the tribe dominating the city in ancient times. Due to the scale, it was impossible to depict more than one church in each settlement, so the most important church of the settlement was chosen to be depicted (e.g. the metropolitan temples of Smyrna, Vourla, Ayvalik, etc.). Indicatively, we managed to collect, identify, digitize and finally represent on the map, data for 237 settlements with Greek population, 175 of which with at least one church, 160 with at least one primary or secondary school and 87 ancient sites, most of which were dominated by Greek tribes (Aeolians, Ionians) during antiquity.

Additionally, the digitized road information was divided into two categories based on Kiepert’s visualization, which are the main road network connecting the major cities and the trails. The rest of the geometric information depicted on the map was visualized with the appropriate typology. Suitable
symbols were also selected for the castles, the Churches of the Apocalypse, the harbours and the rest of thematic symbols. All these symbols can be found on the map and are explained on map’s legend (Fig. 8).

One of the problems, we came across during the cartographic process, was the visualization and placement of all the collected information on the map. The density of the information especially in places such as Smyrna was so high that we had to find different ways to visualize all the data. For this reason, we have recorded a part of the information on tables laying on the empty space of the map.

**Additional Information**

The map is completed with additional information mainly related to settlements’ population, presented in table form on the map (Fig. 9). This information includes more specifically:

- detailed record of all the *kaza*s appearing on the map, with their population, defining also the Greek population according to the 1921 census issued by the Greek Administration Office (Fig. 9),
- presentation of the Smyrna’s Orthodox churches and its western suburbs (Fig. 10),
- the high Schools, operated in Smyrna at the school year 1921-1922 (Fig. 11)
- the 20 largest Greek centres, depicted on the map (Fig. 11),
- detailed records concerning the displaced people during the first phase in 1914 (Fig. 11) and
- the road and rail distances in kilometres from Smyrna to other big cities in the area (Fig. 11).
Figure 10. Additional information concerning the orthodox churches of Smyrna and the number of settlements which are recorded to each Metropolis.

Figure 11. Additional information concerning the secondary schools of Smyrna, the largest Greek centres in “Smyrna Zone” and other information on the area.

The final map depicting all the above described information for the Greek communities in “Smyrna Zone”, as well as details of the map in the original scale are shown in Figures 12,13 and 14.
Figure 12. The area around the city of Smyrna in scale 1:250000. The editing of the map in this area was challenging due to the density of information.

Figure 13. The area around the city of Smyrna in scale 1:250000.
Figure 14. Map of Greek communities in “Smyrna Zone” (1919-1922) in scale 1:250000 (original size: 89.1 x 84).

**Conclusions**

Although the designing of modern maps is becoming faster and easier compared to the past, thanks to online available data, the designing of a map which refers to the past is not so straightforward. The most important part of the procedure in this case is the research on different sources in order to find data, which in most cases, even their existence is ignored. Historical maps depicting the area at specific time periods and textual data from different sources referring to the area and its historical background should be combined to each other and cross-checked for their accuracy, consistency and reliability, in order to be used for a map. Digital technologies play an essential role in this case, since they provide new tools and techniques to bring all this information together and to visualize it on map or to use it for other reasons.
In this study, based on information collected and digitized from different sources, applying cartographic rules, we managed to design a thematic map, depicting the Greek communities of “Smyrna Zone” at the beginning of 20th century, during a transitional period that lasted 3 years, 3 months, 3 weeks and 3 days; a period which started to be very optimistic for the Greeks in “Smyrna Zone”, although it ended totally different. In order not to ignore the presence and the achievements of almost half million Greeks in the wider region of Smyrna (1919-1922), the new map can be seen as a response to M. Notara’s memory, who was rightly wondered about half a century ago:

« Καὶ ἐπειδὴ ἡ ἀκοὴ ἐξασθενεῖ καὶ αὐτὴ μὲ τὴν πάροδον τοῦ χρόνου, διερωτᾶται κανεῖς, ἐάν – μετὰ ἀπὸ ἄλλα πενήντα χρόνια, ὅταν θὰ ἔλθῃ ἡ ἐπέτειος τῶν ἐκατὸν ἐτῶν – θὰ υπάρχουν ἀκόμη μερικοὶ ποῦ θὰ ἀσχολοῦνται τότε μὲ τὴν μνήμην τῆς Μικρᾶς Ἀσίας καὶ τοὺς ἄλλους Ἑλλήνας κατοίκους της».

Translation:
And because hearing weakens over time, one can wonder if - after another fifty years, when the anniversary of one hundred years will come - there will be still some people dealing with the memory of Asia Minor and its Greek residents at that time.16

The map is an attempt to depict the important Greek presence in the area from antiquity to the 20th century, paying a tribute to those who experienced the events of September 22nd, 1922. This effort will only be successful if the map achieves its main goal, which is the communication with its users, providing them effectively and clearly with information about the development of this area at that time. The information collected for this study, organized through a database and visualized through a geographic information system may be used for further analysis in the future, on topics related with the “Smyrna Zone” at the beginning of 20th century.

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