

## MECHANISM OF MODERNIZATION

### **Abstract.**

*Background.* Theory of Modernization is the most important innovation in Social Sciences in the late 50 years. But in spite of numerous versions of this theory all of them lack showing technology of the process. Thus it's extremely urgent to demonstrate links between different spheres of society and stages of the modernization process.

*Materials and methods.* The research was based upon the logic of the historical process and statistics. Knowledge about the dynamics of the Industrial Revolution was substantiated by the understanding of the moving forces of modernization.

*Results.* It is claimed that mechanization was followed the Communication Revolution, the Finance and Banking Revolution. Social and geographic mobility was intensified. Simultaneously modernization of the state mechanism led to strengthening of the political life, formation of the civil society and modernization of the law. Creation of the Legal State based upon strict observance of the law was a final step in the whole process.

*Conclusions.* Discovering of the modernization mechanism is the key element in the modernization theory. In future it will permit to formulate the peculiarities (or models) of the modernization based upon some of its common features.

**Key words:** modernization, mechanization, communication revolution, finance and banking revolution, social and geographic mobility, modernization of state mechanism, strengthening of political life, formation of civil society, modernization of law, creation of legal state.

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## МЕХАНИЗМ МОДЕРНИЗАЦИИ

### **Аннотация.**

*Актуальность и цели.* Теория модернизации является наиболее важной инновацией в социальных науках за последние 50 лет. Но, несмотря на многочисленность версий этой теории, все из них страдают отсутствием показа технологий данного процесса. Таким образом, представляется крайне актуальным продемонстрировать связи между различными сферами развития общества и стадиями модернизационного процесса.

*Материалы и методы.* Исследование было основано на изучении логики исторического процесса и статистических данных. Знание о динамике промышленной революции были подкреплены пониманием движущих сил модернизации.

*Результаты.* Утверждается, что за механизацией последовала революция коммуникаций, финансовая банковская революция. Интенсифицируется социальная и географическая мобильность. Одновременно модернизация государственного механизма ведет к активизации политической жизни, формированию гражданского общества и модернизации права. Создание правового госу-

дарства, опирающегося на строгое соблюдение права, становится финальным шагом модернизационного процесса в целом.

*Выводы.* Раскрытие механизма модернизации является ключевым элементом модернизационной теории. В будущем это позволит сформулировать особенности (или модели) модернизации, основанной на некоторых общих чертах.

**Ключевые слова:** модернизация, механизация, революция коммуникаций, финансовая и банковская революция, социальная географическая мобильность, модернизация государственного механизма, активизация политической жизни, формирование гражданского общества, модернизация права, создание правового государства.

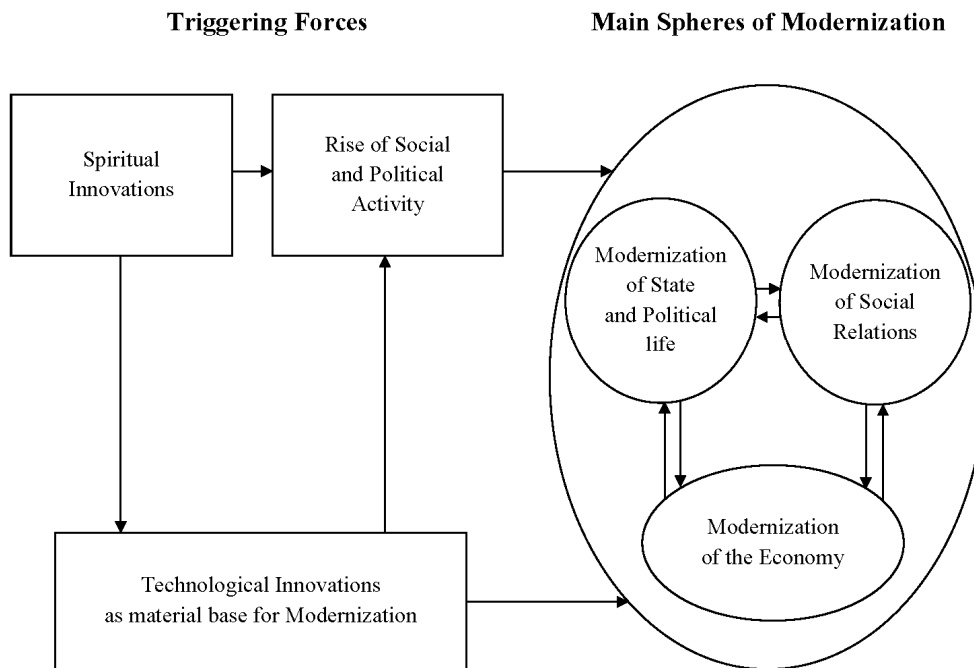
**Modernization** is a transition from traditional society to modern one. It had many faces and manifestations. 'The maelstrom of modern life has been fed from many sources: great discoveries in the physical science, changing our images of the universe and our place in it, the industrialization of production, which transforms scientific knowledge into technology, creates new human environments and destroys old ones, speeds up the whole tempo of life, generates new forms of corporate power and class struggle; immense demographic upheavals, veering millions of people from their ancestral habitats, hurtling them half-way across the world into new lives; rapid and often cataclysmic urban growth; systems of mass communication, dynamic in their development, enveloping and binding together the most diverse people and societies; increasingly powerful national states, bureaucratically structured and operated, constantly striving to expand their powers; mass social movements of people, and peoples challenging their political and economic rulers, striving to gain some control over their lives; finally bearing and driving all these people and institutions along, an ever-expanding, drastically fluctuating capitalist world market [1].

So features of modernization are extremely diverse. But what is its mechanism? It seems that we may reduce different separate impulses and final prerequisites of modernization to social and economic triggering forces which transformed society (see Scheme 1).

The society itself started to feel deep changes in the economy, state and political life, social relations. All these spheres are interrelated with each other. Nevertheless **the most profound and widely acknowledged changes were associated with the economy**. W. W. Rostow in his 'The Stages of Industrial Growth' published in 1956 put forward the idea of development stages. **The first stage of the traditional society** is based on agriculture. **The second stage-preconditions for take-off**, means increased coal and food production. **Stage three-industrial take-off** is a period of sustained economic growth. Then follow the stages of **the drive to industrial maturity and the age of high mass consumption**.

Rostow has now come in for a deal of criticism. With Britain, he pinpoints 1783–1802 as the period when take-off took place. It appears that Rostow has fallen into the trap of citing exact dates for developments which cannot really be tied down so finely. Critics are also quick to point out that many features required for an industrial economy such as efficient communications (railways) did not occur until long after 1802. Furthermore, Rostow's theory ignores the social and political implications which accompany a period of intense industrial change. Finally the question 'What lies beyond the stage of high mass consumption?' might well be posed [2].

One of the principal mistakes made by W. W. Rostow is his refusal to explain how economic modernization work from the point of view of different sectors in the economy and chronology of their development.



Scheme 1

As it's known at the first time mechanization touched only few industrial branches – **mainly textile ones**. This conclusion can be made from the following Table 1.

Table 1

Value added in British Industry (£ m, current) [3]

	<b>1770, %</b>	<b>1801, %</b>	<b>1831, %</b>
Cotton	0,6 (2,6)	9,2 (17,0)	25,3 (22,4)
Wood	7,0 (30,6)	10,1 (18,7)	15,9 (14,1)
Linen	1,9 (8,3)	2,6 (4,8)	5,0 (4,4)
Silk	1,0 (4,4)	2,0 (3,7)	5,8 (5,1)
Building	2,4 (10,5)	9,3 (17,2)	26,5 (23,5)
Iron	1,5 (6,6)	4,0 (7,4)	7,6 (6,7)
Copper	0,2 (0,9)	0,9 (1,7)	0,8 (0,7)
Beer	1,3 (5,7)	2,5 (4,6)	5,2 (4,6)
Leather	5,1 (22,3)	8,4 (15,5)	9,8 (8,7)
Soap	0,3 (1,3)	0,8 (1,5)	1,2 (1,1)
Candles	0,5 (2,2)	1,0 (1,8)	1,2 (1,1)
Coal	0,9 (4,4)	2,7 (5,0)	7,9 (7,0)
Paper	0,1 (0,4)	0,6 (1,1)	0,8 (0,7)
	22,9	54,1	113,0

As we see the volume of value added cost increased for 60 years approximately 5 times, but the value added of cotton products grew more than 40 times. It's share in national value added cost was a little less than a quarter (25 %) with share of iron only 6,7 %.

There is a widespread idea that the Industrial Revolution in Great Britain lasted from 1780's to 1830's [4]. But is necessary to take into account that no one of industrial branches had become technologically perfect up to the second date [5]. It's also seen from the very interesting citation of the acute contemporary who in 1830's tried to define the term 'factory'. For him not all enterprises are factories but only that ones which 'in technology, designates the combined operation of many orders of work-people, adult and young, in tending with assiduous skill a system of productive machines continuously impelled by a central power. This definition includes such organizations as cotton-mills, flax-mills, silk-mills, woolen-mills and certain engineering works; but it excludes those in which the mechanisms do not form a connected series, not are dependent on the prime mover. Of the latter class, examples occur in iron-works, dye-works, soap-works, brass-foundries, etc. Some authors, indeed, have comprehended under the title factory, all extensive establishments wherein a number of people cooperate towards a common purpose of art; and would therefore rank breweries, distilleries as well as the workshops of carpenters, turners, coopers, etc., under the factory system. But I conceive that this title, in its strictest sense, involves the idea of vast automation...' [6].

**Arnold Toynbe**, one of the first theoreticians of the Industrial Revolution, put forward its four main features:

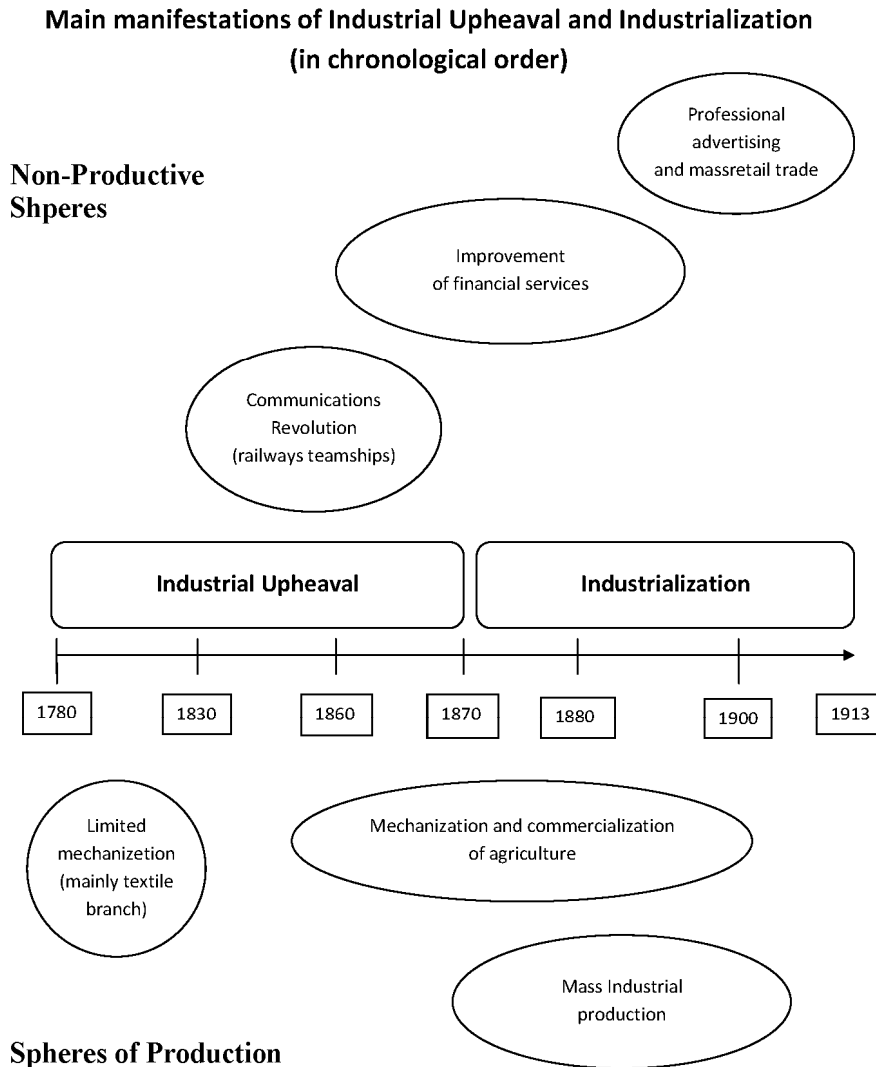
- 1) rapid growth of population;
- 2) the decline of agricultural population, associated with the agrarian revolution which had enclosed fields and consolidated farms;
- 3) the substitution of the factory for the domestic system – embodied in the spinning jenny, Arkwright's water frame, Crompton's mule and the self-acting mule of 1792, which was not however used until 1825;
- 4) the improvement of communications, especially the canal system [7].

The later was extremely important for England because it helped to deliver cheaply masses of fuel, mineral resources to enterprises and finished production to the clients.

**P. Dean**, another specialist in Industrial Revolution, is more extensive in its characteristics. Accordingly to him it has brought about '1) widespread and systematic application of modern science and empirical knowledge to the process of production for the market; 2) specialization of economic activity directed towards production for national and international markets rather than for family or parochial use; 3) movement of population from rural to urban communities; 4) enlargement and depersonalization of the typical unit of production so that it comes to be based less on the family or the tribe and more on the corporate or public enterprise; 5) movement of labor from activities concerned with the production of primary products to the production of manufactured goods and services; 6) intensive and extensive use of capital resources as a substitute for and complement to human effort; 7) emergence of new social and occupational classes determined by ownership of or relationship to the means of production other than land, namely capital' [8].

Economic changes touched different sectors of the economy (productive and non-productive ones) in the following chronological order (see Scheme 2).

For example, **partial mechanization brought steam engines not to all branches of industry.** Even production of iron lagged behind production cotton clothing. Canals had been the predecessors of modern communications – most of them have been built in 1790–1805. But the **communication revolution started only after erection of the first railroads in 1820–1830’s** and it had a great significance **in acceleration of the economic development in 1830–1850’s.**



Scheme 2

New business projects in industry and transportation demanded much money. Nevertheless **small family banks with limited financial resources preferred short-term credits and state finances.** ‘It seems likely that bankers played a larger part in the extension, than in initiation on firms and that the securities they held were mortgages and bonds than shares involving participation in risk industry [9].

The situation changed in the last third of the 19<sup>th</sup> century with coming of **Industrialization.** Industrialization was a more complex and impetuous process

then the First Industrial Revolution (or Industrial Upheaval) and it implied more tense interrelations between different sectors of the economy (see Scheme 3):

1. First of all, **there was mechanization of more branches (in comparison with Industrial Revolution of the first half of the 19<sup>th</sup> century)** thanks to use only of steam power, but electricity (from 1880's). Technological basis of the Industrialization constituted either complimentary mid-19<sup>th</sup> century innovations, developing preceding brilliant ideas (for example steam hammer or compound steam engine) and innovations intended for the future (say, the Bessemer converted and Siemens Martin hearth, the gas motor, etc.) [10]. We witness decisive role not so of consumer branches but heavy industry (metallurgy, machine-building). There was unbelievable concentration and expansion of factories with more than 1000 workers per enterprise.

2. The finishing of the **'communication revolution'** (spreading of railways, steamships, telegraph) which had obvious result up to 1850–1870's stimulated economic and social development. It had created additional demand for products of heavy industry and it facilitated transportation problem for different segments of the economy, including industry, agriculture and items of mass communication. Simultaneously it intensified social contacts and improved quality of life.

3. **Partial mechanization of agriculture** (using McCormick reapers as the most conspicuous example) was of extreme importance from economic and social points of view also. More deep specialization in the agricultural production inspired its more active commercialization. And in turn, more active commerce in agricultural commodities stimulated more deep specialization in agricultural production. Moreover, progress of agriculture increased demand for agriculture machines and other products of industry. It also furthered the development of mass production (for example, thanks to increased delivery of cattle to slaughter-houses conveyor-system in meat-packing flourished).

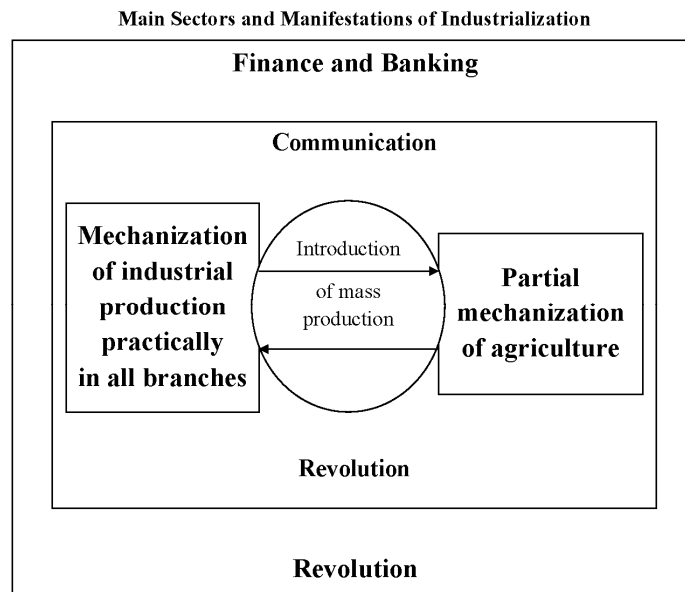
4. Deep mechanization in industry and partial mechanization of agriculture influenced **the appearance of mass production** with conveyors or semi-conveyors or system of swift assembly of products or dressing a carcass. This now process touched, for example, production of boots and shoes, sewing machines, bicycles, meat packing, etc. As a result of mass distribution appeared with big department stores, wholesale firms, professional advertising.

5. In the end, more complex economy with expensive machines and innovations induces **to improve banking, or finance system**. Joint-stock banks (instead of small private banks), insurance and trust companies began to invest heavily and managed to control big industrial and transport enterprises.

**Social consequences of the First Industrial Revolution (or Industrial Upheaval)** were unpleasant for the majority of the people. The factories generated children and women labor, property and social polarization. But big enterprises up to the middle of the 19<sup>th</sup> century were a rarity and craftsmen, not factory workers, dominated in the workforce. **The first wave of urbanization had a limited scope: it touched primarily industrial and craftsmen settlements.**

Industrialization of the last third of the 19<sup>th</sup> Century had other social effects. Though social polarization persisted with division to workers and entrepreneurs, **new middleclass appeared** linked to corporations and big enterprises. New trades (such as salesgirls of department stores, typists, telegraphists, etc) multiplied. And **the level of life risen**. Thus regional and social differences in consumption diminished. In France 'in the 1860's there were still large regional differences in pro-

vincial consumer habits: in Provence a peasant ate white bread: in the north he ate potatoes and rye bread; and in the center of the country he ate chestnuts and potatoes. By 1900 they all ate white bread' [11].



Scheme 3

**Social and geographic mobility intensified.** For example, in the USA in some counties of Wisconsin, Iowa, Kansas, Vermont the typical share of constant settlers among farmers diminished during 20 years from 55–30 % to 40–20 %. But the most important feature **was complete urbanization instead of limited one.** It was typical for the end of the 19<sup>th</sup> Century to have cities with hundreds of thousands and even millions of people (see Scheme 4).

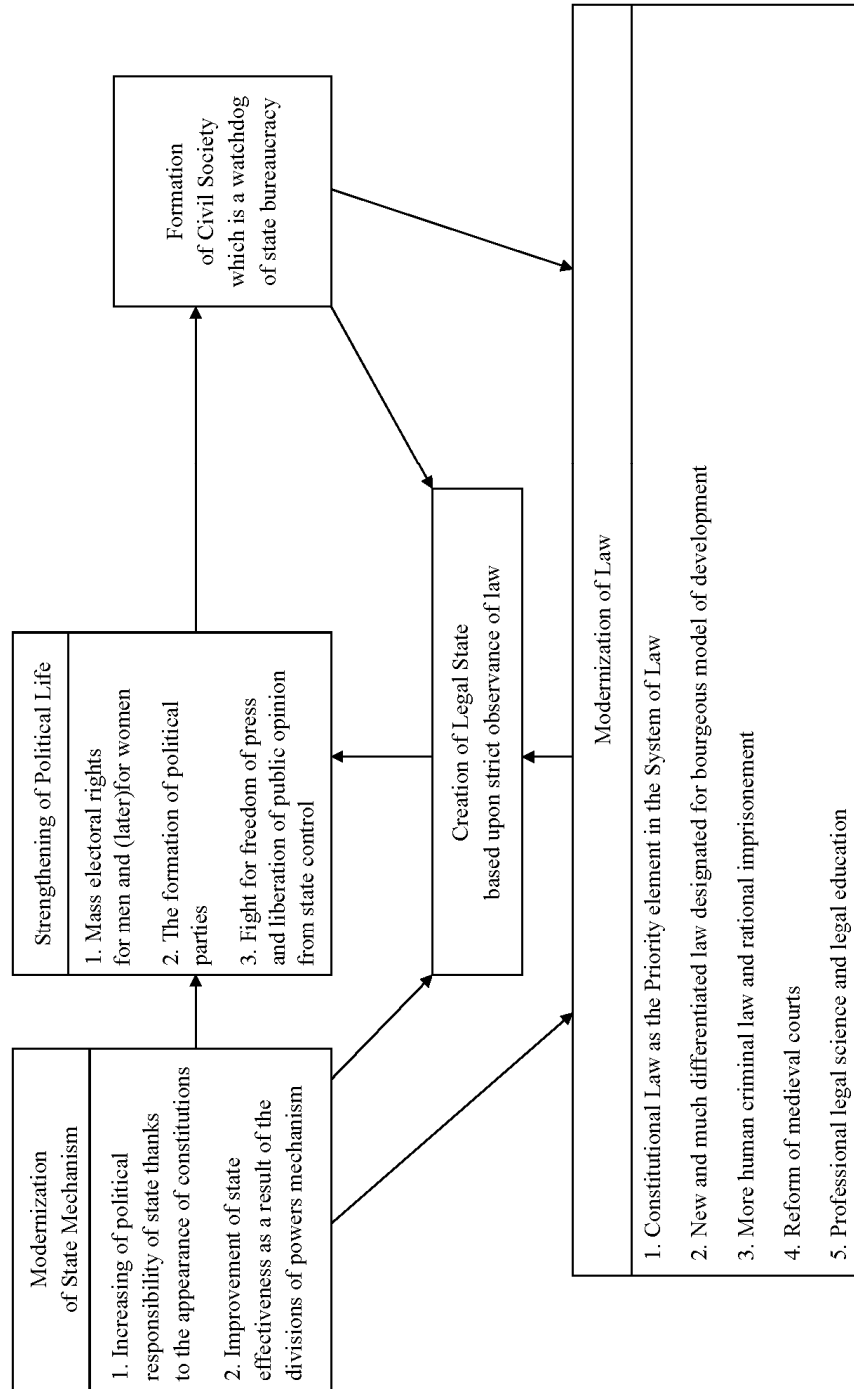
Scheme 4

Population of European Cities (in thousands) [12]

	London	Paris	Berlin	Vienna	St. Petersburg	Rome
1800	831	547	173	247	220	153
1850	2362	1053	420	444	485	175
1880	3779	2269	1122	726	877	300
1900	4536	2714	1899	1675	1133	463

And what about **Modernization of State and Political Life**? It's clear that rise of social and political activity before Modernization and Modernization of the Economy and Social Relations have influenced them greatly. First of all it's necessary to take into account **Modernization of State Mechanism** (see Scheme 5). Great political revolutions of the late 18<sup>th</sup> century increased **political responsibility of state** thanks to adaption of constitutions, which confirmed not only obligations of individuals but their rights. **Division of powers** not only was a democratic innovation to fight with absolutism but **an effective tool of governmental specialization.** Modernization of state under its constitutionalization led to **intensification of political life.**

**Modernization of State and Law**



Scheme 5



The first step in this direction is **granting election rights** for broader and broader groups of citizens. The second one is **the formation of political parties**. And simultaneously **fight for freedom of press** furthered liberation of public opinion from state bureaucratic control.

More complex political system stimulated **formation of Civil Society**. Together with state it influenced Modernization of Law. It was a very slow sluggish process because of natural conservatism of legal system. Nevertheless it's finishing signified the creation of Legal State based upon strict observance of law.

In its classical form Modernization of State and Political Life occupied the whole 19<sup>th</sup> century. Based upon Economic Modernization with its First Industrial Revolution (Industrial Upheaval) and Industrialization **Modernization of State and Political Life is subdivided to Primary Stage and Secondary Stage**. During the First Stage mainly Modernization of State Mechanism and some aspects of Strengthening of Political Life took place. Till the middle of the 19<sup>th</sup> century society was not prepared for deep changes and **only after the Revolutions of 1848–1849 in Europe democracy began to be established**. Two main forces promoted **it-political parties and civil society together with press**.

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