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# Science and Fascism

Scientific Research Under a Totalitarian Regime

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## Outline

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## Timeline

- **1861** Italy achieves [independence](#) and is unified under the [Savoy](#) monarchy. Venice joins the new Kingdom in 1866, Rome in 1870.
- **1863** The [Politecnico di Milano](#) is founded by a mathematician, [Francesco Brioschi](#).
- **1871** The capital is moved from Florence to [Rome](#).
- **1880s** [Colonial period](#) begins (Somalia, Eritrea, Lybia and Dodecanese).
- **1908** IV International Congress of Mathematicians held in Rome, presided by [Vito Volterra](#).

## Timeline (cont.)

- **1913** Emigration reaches highest point (more than **872,000** leave Italy). About 75% of the Italian population is **illiterate** and employed in agriculture.
- **1914** **Benito Mussolini** is expelled from Socialist Party.
- **1915** May: **Italy enters WWI** on the side of the **Entente** against the **Central Powers**. More than **650,000** Italian soldiers are killed (1915-1918). Economy is devastated, peace treaty disappointing.
- **1921** January: **Italian Communist Party** founded in Livorno by **Antonio Gramsci** and other former Socialists. November: **National Fascist Party** founded in Rome by **Mussolini**. Strikes and social unrest lead to political instability.

## Timeline (cont.)

- **1922** October: [March on Rome](#). Mussolini named Prime Minister by the King. The *Unione Matematica Italiana* (UMI) is founded in Bologna by [Salvatore Pincherle](#).
- **1923** The *Consiglio Nazionale delle Ricerche* (CNR) is founded in Rome by [Volterra](#).
- **1924** [Giacomo Matteotti](#), a Socialist leader, is kidnapped and murdered. Opposition MPs walk out in protest.
- **1925** [Mussolini](#) assumes dictatorial powers. Parliament is dissolved, opposition parties outlawed.
- **1928** VIII International Congress of Mathematicians is held in Bologna, presided by [Pincherle](#).

## Timeline (cont.)

- **1931** Oath of allegiance to the King and to the Fascist regime imposed on all State employees.
- **1938** *Manifesto della Razza*. Fall: Anti-semitic laws enacted. All students and professors of Jewish descent expelled. Enrico Fermi wins the Nobel Prize for Physics and leaves Italy for the United States.
- **1940** Italy enters WWII and forms the Rome-Tokyo-Berlin Axis with Germany and Japan. The *Istituto Nazionale di Alta Matematica* (INdAM) is inaugurated in Rome by Francesco Severi.
- **1942** Carpet bombing by US warplanes of Italian cities begins.

## Timeline (cont.)

- **1943** July: **Mussolini** is deposed by the *Gran Consiglio* and **placed under arrest**. September: **Gen. Badoglio** signs Italy's surrender. **Civil war begins** between Fascist loyalists and partisans. **Mussolini rescued** from Gran Sasso prison and taken to Germany.
- **1944** The *Repubblica Sociale Italiana*, a **Nazi puppet government** headed by **Mussolini**, is established in Salò (Northern Italy).
- **1945** April: **all of Italy liberated**. Mussolini is executed.
- **1946** **Referendum** between Monarchy and Republic. Republican Constitution adopted. Provisional government includes **Socialists** and **Communists**. A sweeping **amnesty for all but the most notorious** Fascist Party members is passed. Reconstruction begins.

## Italian science before the Fascist period

For much of the XVIII and first half of the XIX Century, Italy is a **scientific backwater**, especially compared to France, England, and Germany.

Within a few decades of Unification, Italy reaches the **highest levels in mathematics**, especially in the important fields of

- Analysis
- Algebraic Geometry
- Differential Geometry
- Mathematical Physics

By the early 1900s, Italy is a **mathematical powerhouse**, second only to Germany and France. Italy will keep this position for over 20 years.

How did this happen? And **why mathematics**?



## The ascent of Italian mathematics

One simple explanation would be: because mathematics is **cheap**! Even a poor country can afford it.

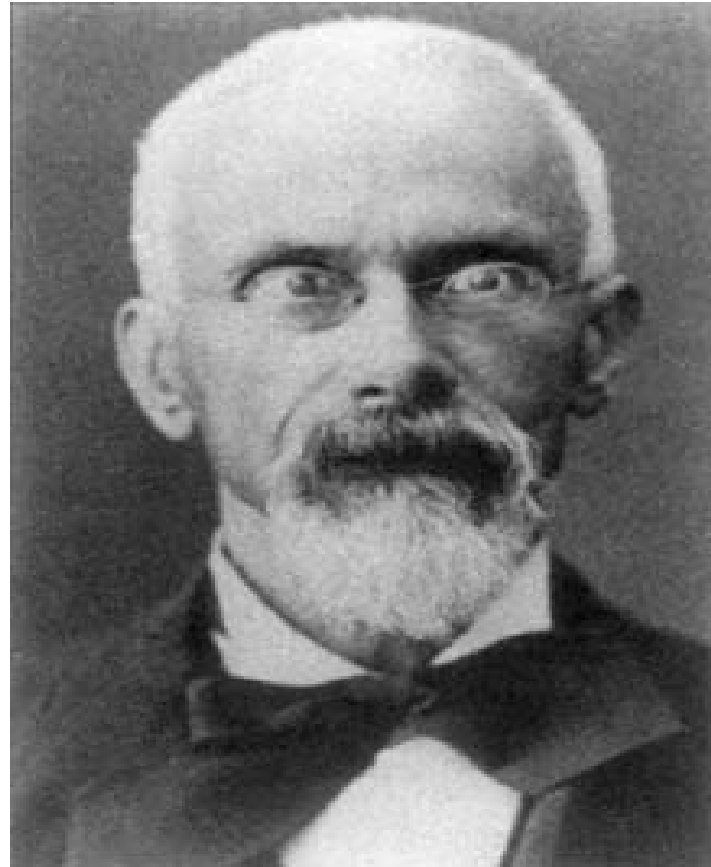
True, but **not enough** to explain the **meteoric rise** of Italian mathematics.

Much of the credit goes to three individuals:

- **Enrico Betti** (1823–1892)
- **Francesco Brioschi** (1824–1897)
- **Felice Casorati** (1835–1890)

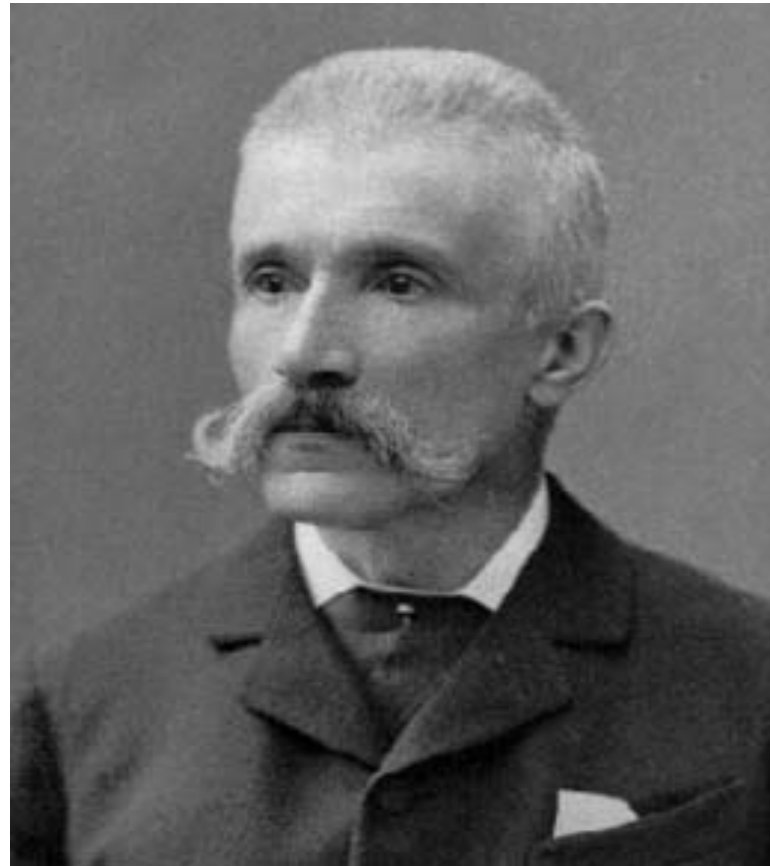
These three friends deliberately set out to build up Italian mathematics. Together they traveled to the European capitals of mathematics (Berlin, Göttingen, Paris) and were in close contact with one of the greatest mathematicians of all times, **Bernhard Riemann**, who spent long periods in Italy. They founded the *Annali di Matematica Pura e Applicata* in 1858.

## Enrico Betti (1823-1892)



Made important contributions to topology, algebra and elasticity theory

## Francesco Brioschi (1824-1897)



Worked on invariant theory, determinants, elliptic functions.

## Felice Casorati (1835-1890)



His main work was in the theory of functions of a complex variable.

## Bernhard Riemann (1826-1866)



One of the greatest mathematicians of all times.

## The ascent of Italian mathematics (cont.)

Other important figures of this period are [Luigi Cremona](#) (1835-1903), founder of the Italian school of algebraic geometry, [Eugenio Beltrami](#) (1835-1900), who made lasting contributions to mathematical physics and differential geometry, and [Ulisse Dini](#) (1845-1918), an influential analyst and long-time director of the *Scuola Normale Superiore* in Pisa.

These mathematicians created important mathematical schools in [Rome](#), [Bologna](#), [Padua](#), [Pavia](#), [Pisa](#) and were in close contact with the leading mathematicians in Germany, France and other European countries.

[Betti](#), [Beltrami](#), [Cremona](#) and [Dini](#) all became [senators](#) and played important roles in shaping the higher education system in Italy.

Pisa, monument to Ulisse Dini (1845-1918)





## Scuola Normale Superiore, Pisa



Piazza dei Cavalieri, Palazzo della Carovana.



## The ascent of Italian mathematics (cont.)

Another crucial event in the history of Italian mathematics is the founding of the *Circolo Matematico di Palermo* in 1884 by [Giovanni Battista Guccia](#) (1855-1914).

In particular, the *Rendiconti del Circolo Matematico di Palermo* quickly becomes one of the most important mathematical journals in the world.

Many famous mathematicians including [Poincaré](#), [Picard](#), [Hilbert](#), [Schmidt](#), [Weyl](#), [Dickson](#), [Birkhoff](#), etc. are members of the Circle and publish in the *Rendiconti*.

By the turn of the century, Italy has reached a leadership position in many fields of pure and applied mathematics.

## The post-Risorgimental generation

The years around 1900 are a golden era for Italian mathematics. The main protagonists of this period are

- Gregorio Ricci-Curbastro (1853-1925)
- Salvatore Pincherle (1853-1936)
- Luigi Bianchi (1856-1928)
- Giuseppe Peano (1858-1932)
- Vito Volterra (1860-1940)
- Corrado Segre (1863-1924)
- Guido Castelnuovo (1865-1952)
- Federigo Enriques (1871-1946)
- Tullio Levi-Civita (1873-1941)

Several of them are graduates of the *Scuola Normale* in Pisa. All of them except Ricci, Bianchi and Peano are Jewish.

Ricci and Levi-Civita created the mathematical methods later used by Einstein in his Theory of General Relativity.

## Salvatore Pincherle (1853-1936)



Founder of UMI, his main work was in complex and functional analysis.

## Giuseppe Peano (1858-1932)



Made important contributions to analysis and mathematical logic.

**Vito Volterra (1860-1940)**



Full professor of Mathematical Physics at age 23.

**Vito Volterra (1860-1940)**



Senator of the Kingdom and “Mr. Italian Science”.

## Corrado Segre (1863-1924)



One of the founders of the Italian school of algebraic geometry.

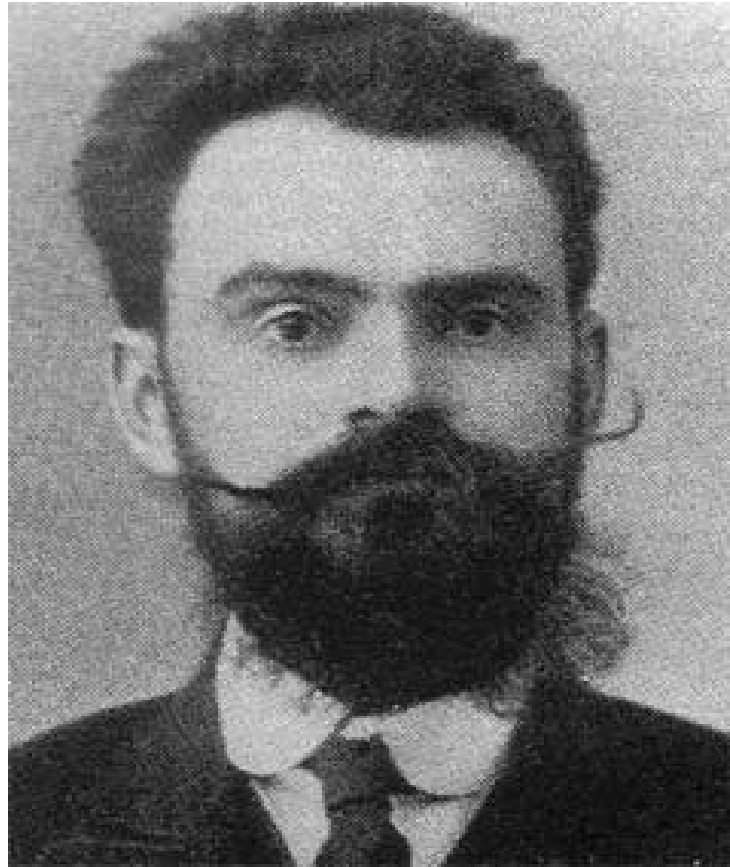
## Guido Castelnuovo (1865-1952)



A great algebraic geometer.



## Federigo Enriques (1871-1946)



Worked in algebraic geometry, history and philosophy of science.

## Federigo Enriques with Albert Einstein



Bologna, inner court of the Palazzo dell'Archiginnasio, 1921.

## Tullio Levi-Civita (1873-1941)



One of the most eminent mathematical physicists in the world.

## The Italian Jewish Community

The Italian Jewish community, which has very ancient origins, has always been rather different from that of other European countries.

It has always been **small** (50,000 people at most), highly integrated, strongly involved in commerce and the professions as well as in politics and higher education, with a **high percentage of non-practicing members**.

Jews were also present in the Armed Forces and fought in the Independence Wars against the Austro-Hungarians and later in World War I, many enlisted as **volunteers**.

People like **Segre**, **Volterra**, **Castelnuovo**, **Enriques** and **Levi-Civita** were deeply imbued with **positivistic values**. They all saw themselves as **liberals** and **free thinkers**.

## Other sciences

Apart from mathematics and mathematical physics, Italian science was rather **poorly developed**. For the most part chemists, physicists, biologists and medical researchers were not on a level comparable with that attained by mathematicians. In fact, a notable **decline** had taken place since pre-unification times, when Italy could boast important physicists and chemists such as **Luigi Galvani**, **Alessandro Volta**, **Amedeo Avogadro** and **Stanislao Cannizzaro**.

A rare exception was **Camillo Golgi** (1843-1926), the **1906 Nobel laureate** for Medicine. Other Italian scientists around 1900 include the physicists **Antonio Pacinotti** (1841-1912), **Augusto Righi** (1850-1920) and **Quirino Majorana** (1871-1957), the electrical engineer **Galileo Ferraris** (1847-1897), and the engineer-inventor **Guglielmo Marconi** (1874-1937), a **1909 Nobel laureate** for Physics and the “official face” of Italian science in the Fascist period.

## Guglielmo Marconi (1874-1937)



Marconi with his invention, the wireless telegraph.

## Other sciences (cont.)

Although these scientists were highly competent, none of them made truly fundamental contributions to modern science.

While Physics was being completely revolutionized by men like [Ludwig Boltzmann](#), [Max Planck](#) and [Albert Einstein](#), their outlook was still essentially a 19th Century one, based on classical theories of mechanics, heat and electromagnetism.

They were mostly experimentalists and were skeptical of the radically new worldviews advanced by theoreticians.

As a rule, they [rejected Einstein's relativity](#) and could not grasp the meaning of the [quantum revolution](#). In contrast, the mathematicians were much more open to these new discoveries.

The destinies of Italian physics will suddenly change with the appearance on the scene of [Enrico Fermi](#) (1901-1954).

## Enrico Fermi (1901-1954)



The great physicist at age 26.



## Enter Mussolini



Benito Mussolini (1883-1945).

## Enter Mussolini (cont.)

When [Mussolini](#) takes over, Italian science is largely dominated by mathematicians. [Vito Volterra](#), who had become a full professor at the age of 23 and a senator at age 46 (in 1906) is known worldwide as [Mr. Italian Science](#).

In 1923 [Volterra](#) establishes the [CNR](#). Together with the [UMI](#) (founded a year earlier by [Pincherle](#)), these two institutions will play an important role during the 1930s in the [fascistization](#) of Italian science, after [Volterra's dismissal](#).

By 1922 the Rome science faculty includes [Volterra](#), [Castelnuovo](#), [Enriques](#), [Levi-Civita](#) and [Francesco Severi](#) (1879-1961), a former student of [Segre](#) and a leading algebraic geometer.

Another prominent mathematician, the analyst [Mauro Picone](#) (1885-1977), will move from Naples to Rome in 1932. There he will build up the [INAC](#), the first research center in the world devoted to [computational mathematics](#).

## Enter Mussolini (cont.)

Rome University, as one of the main centers of mathematical activity, attracts foreign students and post-docs including people of the caliber of [Oscar Zariski](#) (1899-1986), [Dirk Struik](#) (1894-2000), and many others.

In 1927, at age 26, [Enrico Fermi](#), supported by the Roman mathematicians (especially [Castelnuovo](#) and [Levi-Civita](#)) becomes a full professor at the university of Rome and almost immediately proceeds to build the famous but short-lived [school of via Panisperna](#).

At this time, early signs of [anti-semitism](#) begin to appear within the scientific community, in part due to resentment for the power wielded by the tightly knit group of Roman mathematicians. Advised by [Enriques](#), around 1925 [Ascher Zaritsky](#) changes his name to [Oscar Zariski](#).

Oscar Zariski (1899-1986)



Studied in Rome with Castelnuovo and Enriques.

## Enter Mussolini (cont.)

By the mid-1920's, political events begin to affect mathematicians. [Volterra](#) leads a valiant battle against Fascism in the Senate, and is among the so-called *Aventiniani* after the Fascists murdered [Giacomo Matteotti](#), a Socialist leader, in 1924. [Severi](#), a Socialist at the time, resigns in protest from his post as Rector of the University of Rome.

In 1923 the philosopher [Giovanni Gentile](#) joins the Fascist party and is promptly appointed Minister of Education. In 1925 [Gentile](#) and others issue the *Manifesto degli intellettuali del Fascismo*.

It is answered immediately by a [counter-Manifesto](#) written by [Benedetto Croce](#) and signed by many of the leading Italian mathematicians including [Volterra](#), [Levi-Civita](#), [Castelnuovo](#), [Severi](#) as well as by [Beppo Levi](#), [Leonida Tonelli](#), and others.

## Giovanni Gentile (1875-1944)



The leading Fascist intellectual and philosopher.

## Benedetto Croce (1866-1952)



The leading anti-Fascist intellectual and philosopher.

## Enter Mussolini (cont.)

The 1928 International Mathematical Congress was held in [Bologna](#). It has sometimes been described as “the funeral of Italian mathematics,” which was then beginning to show the first symptoms of a [deep crisis](#).

In retrospect, it is clear that the leading Italian researchers had by then begun to decline and that their replacements, while generally very good, were not quite at the same level as the old masters. Moreover, some [important new fields](#) of research were being [virtually ignored](#).

Among these we mention [abstract algebra](#) and [topology](#), which were rapidly developing in [Germany](#) but also in the emerging mathematical community of the [United States](#) as well as in [Poland](#) and the [Soviet Union](#).



## The Oath

In the 1930s the regime's grip on every aspect of Italian life becomes stronger and stronger.

In 1931 [Severi](#) convinces [Gentile](#) to demand of all university professors an [oath of allegiance to the King and to the Fascist regime](#). Until then, unlike other State employees, university professors had been exempt from taking any oath.

In all, only 20 professors and academicians (out of approximately 1200) refuse to take the oath and are forced to resign; among them [Volterra](#), who is wealthy and moves to France in a self-imposed exile.

Other professors with antifascist leanings, including [Levi-Civita](#), attempt to use their connections to find a way out but in the end they have to cave in in order to keep their job.

## The Godfathers: Severi and Picone

By 1930, Italian mathematics is effectively in the hands of two men: [Severi](#), who by then has set aside his initial opposition to the Fascist regime, and [Picone](#), who has been a convinced Fascist since the very beginning.

A year earlier the venerable but politically unreliable *Accademia dei Lincei* has been disbanded and replaced by the more pliable *Accademia d'Italia*; scientists loyal to the Fascist regime are rewarded with a seat in it, and the huge perks and power that go with it.

[Severi](#) is among the first to attain membership and, with it, the title of *Sua Eccellenza*; [Fermi](#) is another one.

**Francesco Severi (1879-1961)**



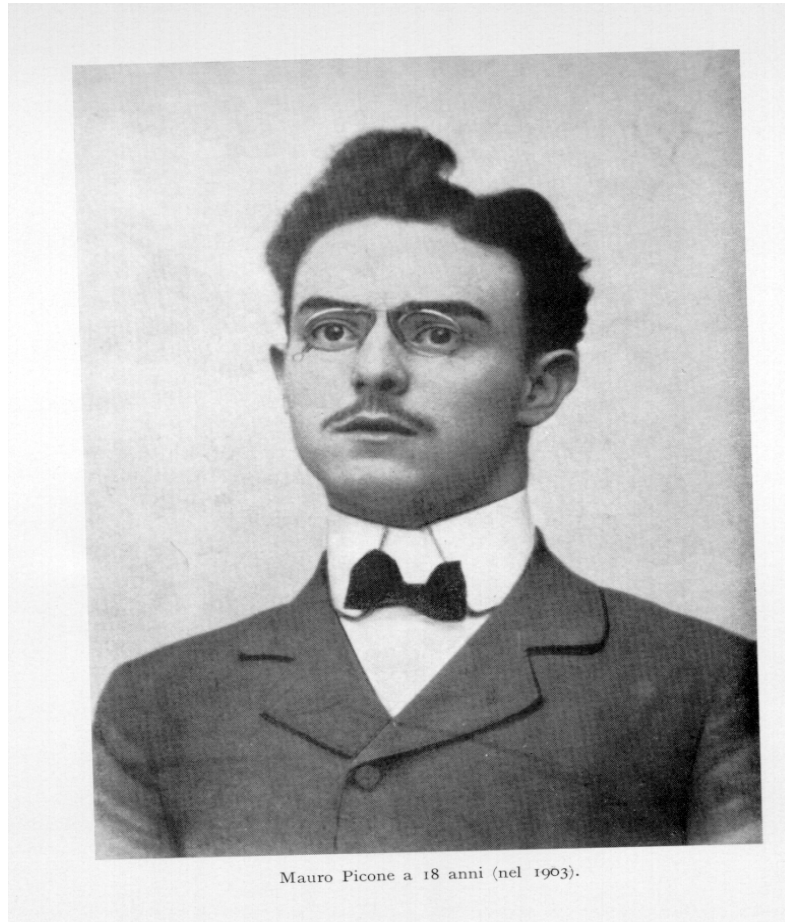
Eminent algebraic geometer.

**Francesco Severi (1879-1961)**



Godfather of Italian pure mathematics in the 1930s.

## Mauro Picone (1885-1977)



As a student at the Scuola Normale in Pisa.

## Mauro Picone (1885-1977)



Founder of an important school of mathematical analysis.

## The Godfathers: Severi and Picone (cont.)

Severi and Picone represented the two souls of Italian mathematics: the “pure” and the “applied” one.

Severi insisted on the **intrinsic value** of mathematical thought (regardless of its possible applications) and elected himself to the role of defender of the **Italian school of algebraic geometry**, its methods, and results, which were being strongly criticized by foreign mathematicians.

Picone was eager to put mathematics to work at the service of society and to increase the **industrial** and **military strength** of the country. His own work was mostly in analysis. He was fond of saying **Applied Mathematics = Fascist Mathematics!**

Picone's interest in effective methods of solution of **differential equations** originated from his service as an **artillery officer** in WWI.

## The Godfathers: Severi and Picone (cont.)

The importance of [Picone](#) lies primarily in his institutional role, his vision, and his school, which was to lead the [recovery](#) of Italian mathematics after WWII. Because of his [openness](#) to new currents of thought, he proved instrumental to the survival of mathematical analysis research in Italy.

[Picone](#) trained many young mathematicians who would later be famous, including [Renato Caccioppoli](#), [Lamberto Cesari](#), [Giuseppe Scorza Dragoni](#), [Gianfranco Cimmino](#), [Carlo Miranda](#), [Gaetano Fichera](#) and, after WWII, [Ennio De Giorgi](#).

The most famous of these was [Renato Caccioppoli](#) (1904-1959), who acted as a bridge between the pre- and post-war generations. His life (and death) was dramatic enough to make him the subject of several books and a remarkable 1992 movie by [Mario Martone](#), *Morte di un matematico napoletano*, casting [Carlo Cecchi](#) as [Caccioppoli](#).

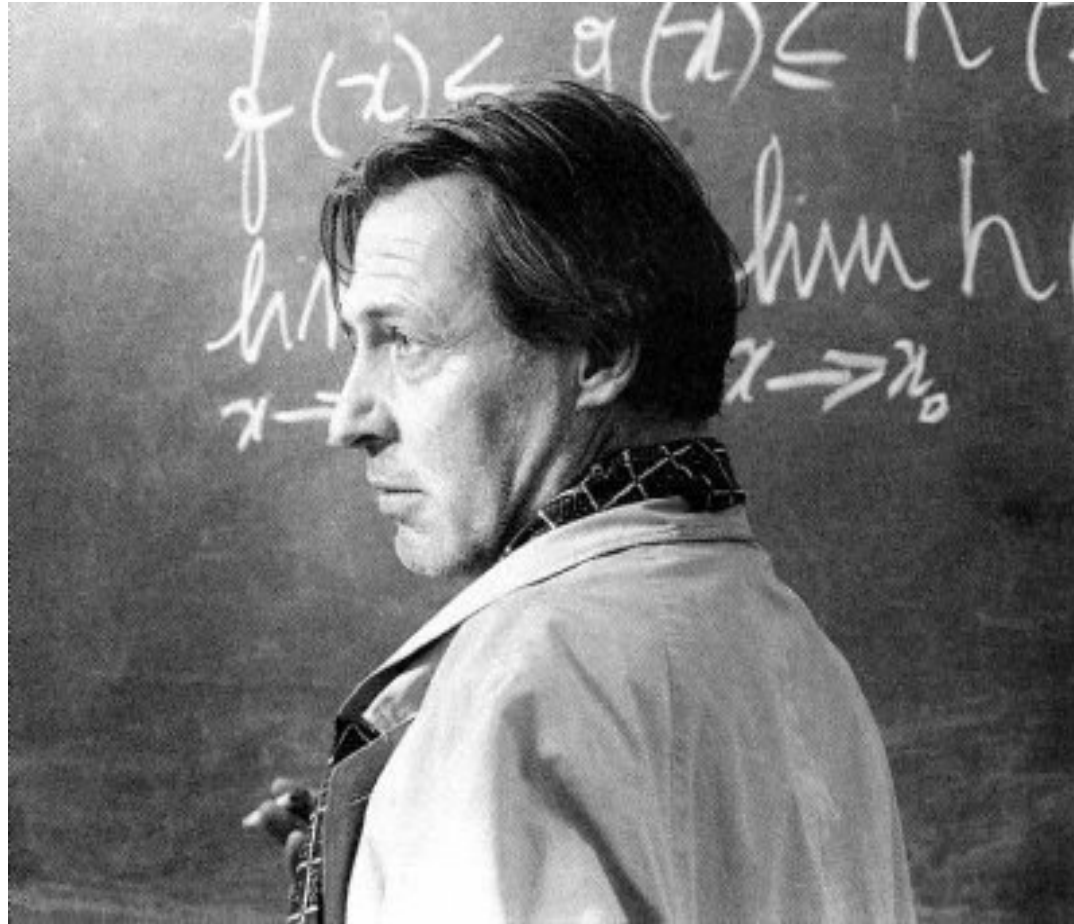


## Renato Caccioppoli (1904-1959)



A brilliant mathematician and a courageous antifascist.

**From *Morte di un matematico napoletano* (1992)**



Actor Carlo Cecchi in the role of Caccioppoli.

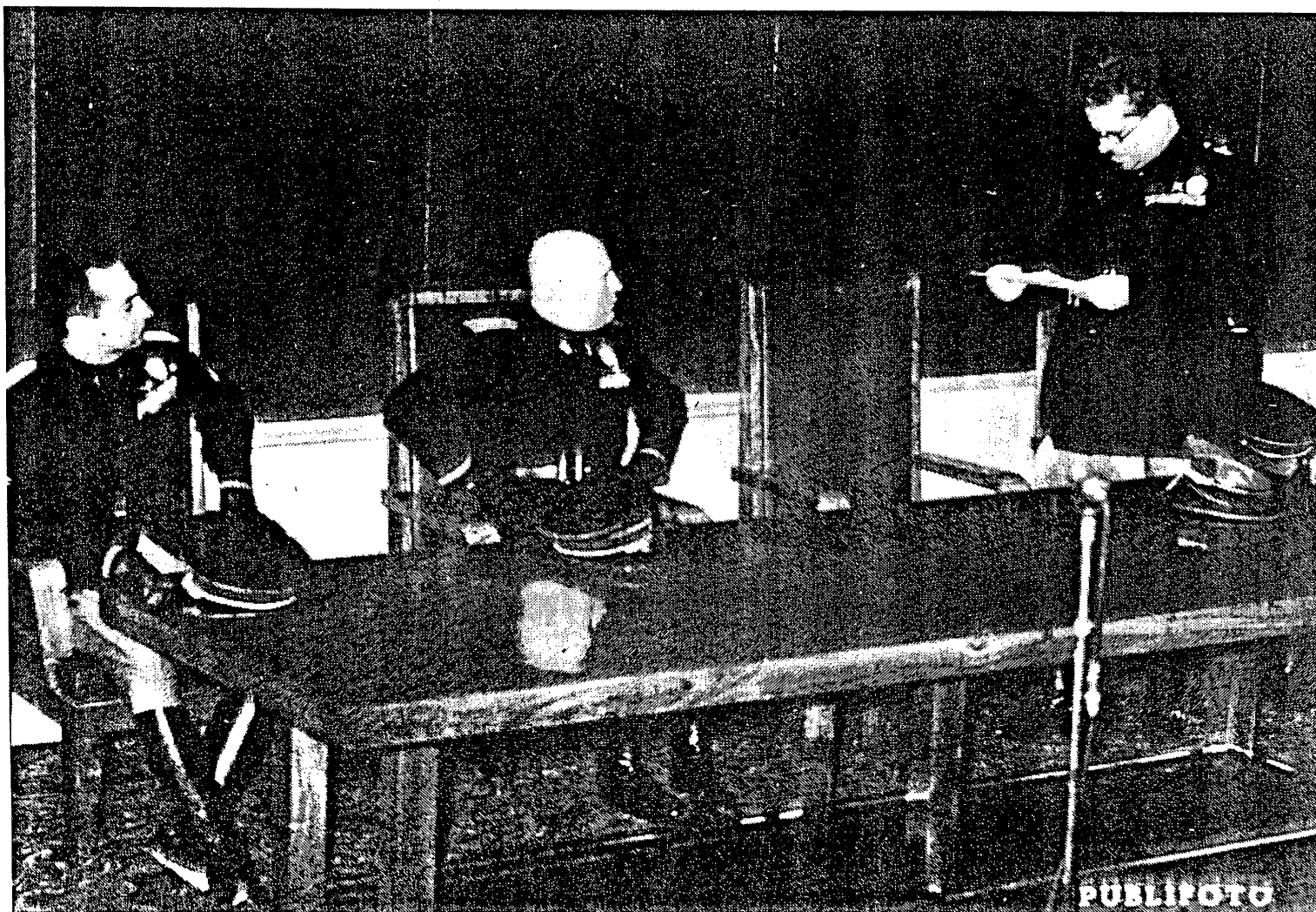
## The Godfathers: Severi and Picone (cont.)

[Severi](#) yielded even greater power and influence than [Picone](#), to whom he was superior as a mathematician. [Severi's](#) international fame was such that on a conference tour of [Japan](#) in 1937 he was received by the [Emperor](#). At the end of his life, he belonged to 26 scientific academies worldwide.

[Severi](#) had direct access to [Mussolini](#). He used his influence to exert [complete control](#) on every aspect of mathematical life in Italy: competitions for university positions, editorial boards of major journals, publications and translations of books, conferences, educational policy, etc.

In 1940 [Severi](#) inaugurated the *Istituto Nazionale di Alta Matematica* ([INdAM](#)) in Rome, with [Mussolini](#) and Italy's Minister of Education, [Giuseppe Bottai](#), in attendance.

**INdAM Inauguration (1940)**



Roma, 15 aprile 1940. Il duce all'Istituto di Alta Matematica alla città universitaria ascolta con Bottai il discorso del prof. Severi. (Publifoto)

## Rapid decline

In the 1930s Italian mathematics enters a **deep crisis**. The causes of this decline are both **internal** to the various disciplines and **external**.

In some areas, like **analysis** and **mathematical physics**, activity remains at a decent level, but far from the past glories.

In other fields, like **algebraic geometry**, despite the presence of excellent researchers the Italian school is no longer able to keep up with modern developments, which are often dismissed as “fads”.

Italian mathematics is becoming increasingly **provincial**. Young researchers could **jeopardize their career** if they tried to keep up with contemporary trends abroad.

In contrast, during the 1930s Italian **Physics** enjoys increasing international prestige thanks to the work of **Fermi** and his group.

**Enrico Fermi with his closest collaborators (Rome, 1934)**



D'Agostino, Segrè, Amaldi, Rasetti and Fermi, via Panisperna.

## Rapid decline (cont.)

Among the **external** factors, it should be kept in mind that in the 1930s Italy becomes increasingly **isolated** (economically, politically and culturally) as a result of the **colonial campaigns** in **Africa** and the consequent economic sanctions.

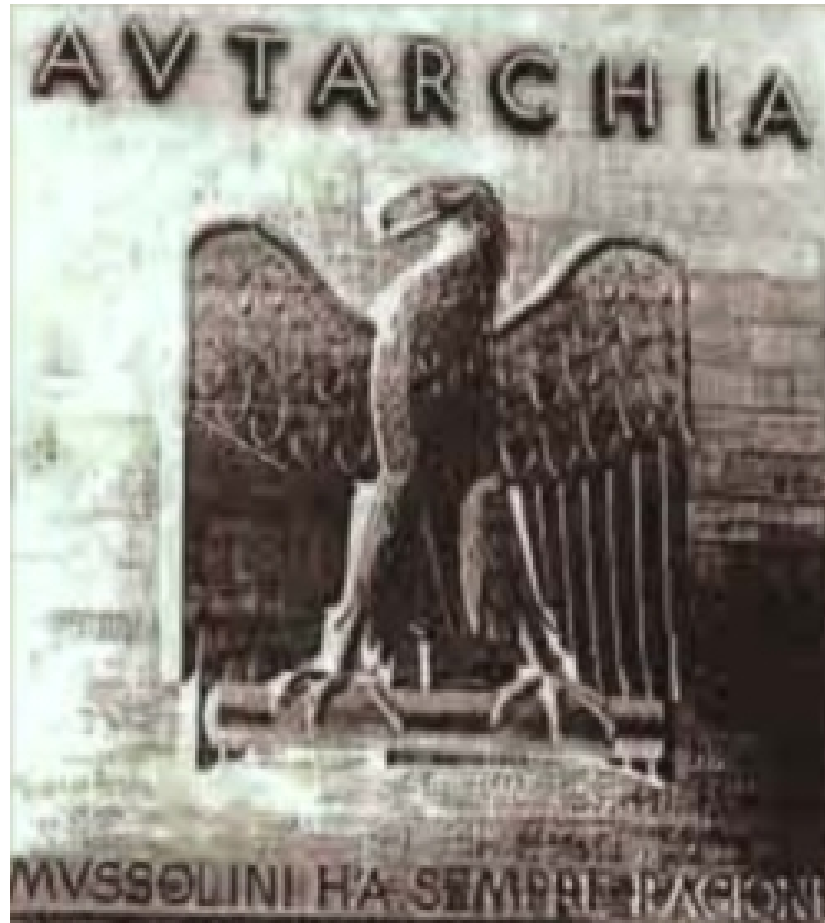
Travel, visitors, conferences, journal subscriptions become more and more problematic. The so-called *Autarchia* is enforced.

The **rigid hierarchical organization** of society (including universities) does not encourage innovative, independent work on the part of the new generations being formed.

A **sterile rivendication** of Italy's "leadership" in mathematics (by now a fading memory) replaces honest confrontation with the stimuli coming from other, more advanced nations.



## Autarchic propaganda in the Thirties, 1



## Autarchic propaganda in the Thirties, 2

1890 **FONOGRAFO ITALIANO** 1940  
Raccolta di vecchie incisioni scelte e presentate da Paquito Del Bosco

**robur**  **Autarchia!**

**52%**  
**48%**

PRODOTTI ITALIANI

● Un'esperienza professionale  
lunghi studiati e realizzati in Italia da  
lucei italiani, la presenza di A.G.I.P.  
di parte sul mercato il ROBUR  
che sottolinea, vantaggiosamente la  
benzina e conferisce al motore:  
potenza, elasticità, alto rendimento.

**robur**  
IL NOSTRO CARBURANTE

*vitodallatorre.blogspot.com*

Autarchic propaganda in the Thirties, 3



## Day of infamy



## Day of infamy (cont.)

In the Fall of 1938, under pressure from [Hitler](#), [Mussolini's](#) regime approves a set of [anti-Semitic laws](#). The effect of these measures is to [exclude Jews](#) from virtually all aspects of Italian life.

The ground has been prepared by [extensive anti-Jewish propaganda](#) on the political front, and by the infamous *Manifesto della Razza* on the ideological front.

This document is drafted by a group of medical researchers, zoologists, anthropologists and other self-styled scientists. Two prominent academics, [Nicola Pende](#) (1880-1970) and [Sabato Visco](#) (1888-1971), are among the authors.

The *Manifesto* was endorsed by the powerful Propaganda Ministry (MIN-CULPOP).

## Day of infamy (cont.)

The *Manifesto* stated the existence of a **pure Italic race** (belonging to the Aryan family) and the need to defend its purity from contamination by “extra-European races.”

One of the **immediate effects** is the **dismissal** of nearly all professors, teachers, and students of **Jewish heritage** from all schools, at all levels.

Among mathematicians, **Castelnuovo**, **Enriques**, **Levi-Civita**, **Fubini**, **B. Levi**, **G. Ascoli**, **G. Fano**, **A. Terracini** and **B. Segre** are ousted from their positions and from the editorial boards of journals.

**Castelnuovo** helps organize and direct the clandestine “Jewish university.” He and **Enriques** spend the war years in Rome, hidden by friends. Others emigrate to the US, the UK, Switzerland, Argentina, etc.

## Racist propaganda, 1





## Racist propaganda, 2





## Racist propaganda, 3



# Manifesto della Razza, 1938

## RAZZISMO ITALIANO

Un gruppo di studiosi fascisti docenti nelle Università italiane sotto l'egida del Ministero della Cultura Popolare ha fissato nei seguenti termini quella che è la posizione del Fascismo nei confronti dei problemi della razza:

**1** LE RAZZE UMANE ESISTONO. — La esistenza delle razze umane non è già una astrazione del nostro spirito, ma corrisponde a una realtà fenomenica, materiale, percepibile con i nostri sensi. Questa realtà è rappresentata da masse, quasi sempre imponenti, di milioni di uomini, simili per caratteri fisici e psicologici che furono ereditati e che continuano ad ereditarsi. Dire che esistono le razze umane non vuol dire a priori che esistono razze umane superiori o inferiori, ma soltanto che esistono razze umane differenti.

**2** ESISTONO GRANDI RAZZE E PICCOLE RAZZE. — Non bisogna soltanto ammettere che esistono i gruppi sistematici maggiori, che comunemente sono chiamati razze e che sono individualizzati solo da alcuni caratteri, ma bisogna anche ammettere che esistono gruppi sistematici minori (come per es. i nordici, i mediterranei, i dinarici, ecc.) individualizzati da un maggior numero di caratteri comuni. Questi gruppi costituiscono dal punto di vista biologico le vere razze, la esistenza delle quali è una verità evidente.

**3** IL CONCETTO DI RAZZA E' CONCETTO PURAMENTE BIOLOGICO. Esso è quindi basato su altre considerazioni che non i concetti di popolo e di nazione, fondati essenzialmente su considerazioni storiche, linguistiche, religiose. Però alla base della differenza di popolo e di nazione stanno delle differenze di razza. Se gli Italiani sono differenti dai Francesi, dai Tedeschi, dai Turchi, dai Greci, ecc., non è solo perchè essi hanno una lingua diversa e una storia diversa, ma perchè la costituzione razziale di questi popoli è diversa. Sono state proporzioni diverse di razze differenti che da tempo molto antico costituiscono i diversi popoli, sia che una razza abbia il dominio assoluto sulle altre, sia che tutte risultino fuse armonicamente, sia, infine, che persistano ancora inassimilate una alle altre le diverse razze.

**4** LA POPOLAZIONE DELL'ITALIA ATTUALE E' DI ORIGINE ARIANA E LA SUA CIVILTÀ E' ARIANA. — Questa popolazione a civiltà ariana abitata da diversi millenni la nostra penisola; ben poco è rimasto della civiltà delle genti preariane. L'origine degli Italiani attuali parte essenzialmente da elementi di quelle stesse razze che costituiscono e costituiscono il tessuto perennemente vivo dell'Europa.

**5** E' UNA LEGGENDA L'APPORTO DI MASSE INGENTI DI UOMINI IN TEMPI STORICI. — Dopo l'invasione dei Longobardi non ci sono stati in Italia altri notevoli movimenti di popoli capaci di influenzare la fisionomia razziale della nazione. Da ciò deriva che, mentre per altre nazioni europee la composizione razziale è variata notevolmente in tempi anche moderni, per l'Italia, nelle sue grandi linee, la composizione razziale di oggi è la stessa di quella che era mille anni fa; i quarantaquattro milioni d'Italiani di oggi rimangono quindi nell'assoluta maggioranza a famiglie che abitano l'Italia da un millennio.

**6** ESISTE ORMAI UNA PURA "RAZZA ITALIANA". — Questo enunciato non è basato sulla confusione del concetto biologico di razza con il concetto storico-linguistico di popolo e di nazione, ma sulla purissima parentela di sangue che unisce gli Italiani di oggi alle generazioni che da millenni popolano l'Italia. Questa antica purezza di sangue è il più grande titolo di nobiltà della Nazione italiana.

**7** E' TEMPO CHE GLI ITALIANI SI PROCLAMINO FRANCAMENTE RAZZISTI. — Tutta l'opera che finora ha fatto il Regime in Italia è la fondo del razzismo. Frequentissimo è stato sempre nei discorsi del Capo il richiamo ai concetti di razza.

La questione del razzismo in Italia deve essere trattata da un punto di vista puramente biologico, senza intenzioni filosofiche o religiose.

La concezione del razzismo in Italia deve essere essenzialmente italiana e l'indirizzo ariano-nordico. Questo non vuole dire però introdurre in Italia le teorie del razzismo tedesco come sono e affermare che gli Italiani e gli Scandinavi sono la stessa cosa. Ma vuole soltanto additare agli Italiani un modello fisico e soprattutto psicologico di razza umana che per i suoi caratteri puramente europei si stacca completamente da tutte le razze extra europee, questo vuol dire elevare l'Italiano ad un ideale di superiore coscienza di se stesso e di maggiore responsabilità.

**8** E' NECESSARIO FARE UNA NETTA DISTINZIONE TRA I MEDITERRANEI D'EUROPA (OCIDENTALI) DA UNA PARTE GLI ORIENTALI E GLI AFRICANI DALL'ALTRA. — Sono perciò da considerarsi pericolose le teorie che sostengono l'origine africana di alcuni popoli europei e comprendono in una comune razza mediterranea anche le popolazioni semitiche e comitiche stabilendo relazioni e simpatie ideologiche assolutamente inammissibili.

**9** GLI EBREI NON APPARTENGONO ALLA RAZZA ITALIANA. — Dei semiti che nel corso dei secoli sono approdati sul sacro suolo della nostra Patria nulla in generale è rimasto. Anche l'occupazione araba della Sicilia nulla ha lasciato all'intuori del ricordo di qualche nome; e del resto il processo di assimilazione fu sempre rapidissimo in Italia.

Gli ebrei rappresentano l'unica popolazione che non si è mai assimilata in Italia perchè essa è costituita da elementi razziali non europei, diversi in modo assoluto dagli elementi che hanno dato origine agli Italiani.

**10** I CARATTERI FISICI E PSICOLOGICI PURAMENTE EUROPEI DEGLI ITALIANI NON DEVONO ESSERE ALTERATI IN NESSUN MODO. — L'unione è ammissibile solo nell'ambito delle razze europee, nel quale caso non si deve parlare di vero e proprio ibridismo, dato che queste razze appartengono ad un corpo comune e differiscono solo per alcuni caratteri, mentre sono uguali per moltissimi altri. Il carattere puramente europeo degli Italiani viene alterato dall'incrocio con qualsiasi razza extra-europea e portatrice di una civiltà diversa dalle millenarie civiltà degli ariani.

## Manifesto della Razza, 1938 (cont.)



“This is an Aryan business”

## Day of infamy (cont.)

The response of the [official body of Italian mathematicians](#), the UMI comes on December 10, 1938. This is the [darkest day](#) in the society's entire history.

The UMI issues a statement according to which the “departure” of “mathematicians of Jewish race” has had a [minimal impact](#) on the status and health of Italian mathematics.

Moreover, the document expresses [concern](#) that the university chairs that have just become vacant could be redirected to other disciplines, something to be avoided [at all costs](#).

For the next few years, several members of the UMI will devote themselves to [rewriting the history of Italian mathematics](#) in a way that minimized (and indeed, erased) the contributions of Jewish mathematicians.

## Day of infamy (cont.)

Some mathematicians seize the opportunity to settle the score against their colleagues. **Severi** takes full advantage of the situation to harass **Enriques**, his ancient teacher and collaborator, with whom he has clashed for personal and scientific reasons in the previous years.

He forbids him from entering the Mathematical Institute at the University of Rome, of which he is now Director.

**Severi** also obtains the **withdrawal** of the geometry textbook by **Enriques** and **U. Amaldi**, adopted in all Italian high schools, and its replacement with his own textbook, a **very lucrative move!**

## Day of infamy (cont.)

The impact of anti-Semitic law is even worse on Italian Physics and Biology, which are devastated.

Of Fermi's collaborators, only Edoardo Amaldi decides to stay. By 1939 Fermi (whose wife Laura was Jewish), Emilio Segrè (Nobel Prize 1959), Franco Rasetti, Bruno Rossi, Eugenio Fubini, Ugo Fano, Giulio Racah, Leo Pincherle, Sergio De Benedetti and Bruno Pontecorvo have left Italy. Also, Ettore Majorana mysteriously disappears in 1938.

During WWII Fermi, Segrè and Rossi work at Los Alamos on the atom bomb, as part of the Manhattan Project.

Among biologists, Italy loses two future Nobel prizes: Salvatore Luria and Rita Levi Montalcini, both students of Giuseppe Levi (the father of the writer Natalia Ginzburg) in Turin.



**Giulio Racah (1908-1965)**



The theoretical physicist as a student in Florence.

## Giulio (Yoel) Racah (1908-1965)



Commemorative stamp, Israel. Racah co-founded the Hebrew University.



Bruno Pontecorvo (1913-1993)



Бруно Понтекорво

Pontecorvo eventually emigrated to the Soviet Union.

**Enrico Fermi and Emilio Segrè, New Mexico (1945)**



Fermi and Segrè, Valle Grande (near Los Alamos), July 1945

## Fascist rethoric in science

Like every other aspect of Italian life, scientific research is not immune from the [changes in language](#) that results from the Fascistization of the country.

Of course, scientific prose does not lend itself to the bombastic; to see this change one has to look into the [prefaces to research monographs](#), the [accounts of scientific meetings](#) in the press, [book reviews](#), [reports](#), [letters](#), etc.

Strongly nationalistic tones, with many references to the [Italic genius](#) and the [race](#), become [virtually mandatory](#) during the 1930s.

Some historians, like [Ettore Bortolotti](#) (1886-1947), undertake the task of exalting Italys' contributions to mathematics. Many become [obsessed with priority claims](#).

Example: [Joseph Louis Lagrange](#) becomes *"l'italianissimo Lagrangia"* ...

**From the preface of a book by Gaetano Scorza (1940)**

*La teoria dei gruppi astratti non ha in Italia numerosi cultori. È da augurarsi che questo Trattato, per quanto non ancora completo (esso non comprende p. es. la teoria dei gruppi liberi), richiami su questioni così belle e profonde l'attenzione dei nostri ricercatori. Essi non dimentichino che la matematica progredisce, pur sotto l'aspetto di strumento utile alle applicazioni, soltanto se non se ne trascurano anche i rami più alti ed astratti, verso i quali la linfa vitale tende, per trarne più sostanziale alimento e donde derivano spesso inaspettate visioni applicative.*

*GAETANO SCORZA, con quest'opera postuma di carattere logico-algebrico, come i suoi studi sulle algebre e sulle matrici di RIEMANN, corona la propria attività matematica, nella quale son fuse le qualità artistiche e intuitive della nostra razza (di che egli diede saggi mirabili ne' suoi lavori geometrici), collo spirito logico, che potenziò in ogni tempo l'intelletto di filosofi, politici e giuristi italiani.*

*Al figlio DINO, a Lui premorto, giurista di acutissimo ingegno, Egli voleva dedicare questo libro. La sua volontà oggi adempiamo, con devozione amichevole, nell'associare la memoria di Dino a quella del Maestro, che vive in queste pagine.*

FRANCESCO SEVERI

**From a speech by Giuseppe Bottai (1940)**

Né a questo soltanto si limitarono i matematici italiani. In occasione del secondo congresso nazionale dell'Unione matematica italiana del 1940, il presidente dell'Umi Luigi Berzolari inviava al prefetto di Bologna una lettera richiedente aiuti per l'organizzazione in cui si leggevano frasi del genere:

Tale Congresso avrà interesse veramente nazionale, poiché sarà una rivista della produzione matematica italiana nell'ultimo triennio, e verrà a dimostrare che, anche dopo la dipartita dei professori di razza ebraica, non è venuta meno la produzione scientifica nel nostro paese, anzi, che nel clima fascista essa ha ripreso nuova vita e vigore<sup>144</sup>.

E i congressisti applaudirono Bottai che inaugurava i lavori facendo eco alle parole di Berzolari:

S'affermò in quel Congresso<sup>145</sup> (e in questo se ne avrà di certo, la solare conferma) il primato dell'Italia nella geometria algebrica, nel calcolo delle variazioni, nella geometria proiettiva differenziale; la sua posizione di primissimo piano nelle teorie delle funzioni, delle equazioni differenziali, delle algebre, della relatività, delle trasformazioni termoelastiche, negli studi di calcolo delle probabilità e attuariale, di storia delle matematiche, di storia dei numeri. Più che un trionfo è una rivelazione: la matematica italiana, non più monopolio di geometri d'altre razze, ritrova la genialità e la poliedricità tutta sua propria per cui furono grandi nel clima dell'unità della Patria, i Casorati, i Brioschi, i Betti, i Cremona, i Beltrami, e riprende, con la potenza della razza purificata e liberata, il suo cammino ascensionale<sup>146</sup>.

Altro che cammino ascensionale... L'isolamento della ricerca matematica italiana negli anni della guerra è in qualche modo testimoniato dal «Convegno internazionale» tenuto a Roma nel novembre '42 e organizzato dall'Istituto di alta matematica di Severi. Gli atti del convegno, cui parteciparono solo matematici dei paesi fascisti o fascistizzati, mostrano la totale assenza o la presenza pressoché marginale ed episodica del nostro paese in settori centrali della ricerca matematica: teoria dei numeri, topologia e gruppi topologici, algebra commutativa. Ci si può

## The effect of Nazism on German science

It is natural to compare the situation in Italy with that of other nations, especially [Germany](#). During the Weimar years, Germany had achieved a position of [absolute excellence](#) in mathematics and physics, particularly in the universities of [Göttingen](#), [Münich](#) and [Berlin](#).

All this came to an abrupt end in 1933, with the advent of [Hitler](#). However a few scientists, like [Einstein](#) and [John von Neumann](#), had moved to the US as early as 1930.

The Nazi virtually [destroyed](#) German science. Nearly all the leading mathematicians and physicists were forced or decided to leave. The vast majority emigrated to the US, [enormously benefitting American science](#), which was already on the rise on its own.

Also, the flourishing [Polish](#) and [Hungarian](#) mathematical schools were completely wiped out by the Nazi invasion, with many prominent scientists murdered or sent to concentration camps.



## John von Neumann (1903-1957)



Father of the computer, one of the greatest scientists of the 20th century.

## Richard Courant (1888-1972)



Founder of the American school of applied mathematics.

## Emmy Noether (1882-1935)



Founder of the German school of abstract algebra.

**Bandelier National Monument, near Los Alamos**



Stan Ulam, Richard Feynman and von Neumann after a hike, ca. 1950.

## Hiking near Los Alamos, New Mexico



Enrico Fermi, Peter Lax and others hiking in New Mexico.

## The aftermath: amnesty or amnesia?

After the fateful date of [8 September 1943](#) a number of mathematicians, including some who had been active in Fascist politics, join the *Resistenza* and fight against the Nazi-Fascists oppressors. [Leonida Tonelli](#), the Director of the *Scuola Normale* in Pisa, is among them.

The logician [Ludovico Geymonat](#) (1908-1991) commands a *Brigata Garibaldi* in the North of Italy. Another partisan, the mathematical physicist [Antonio Pignedoli](#) (1918-1989), is elected to the *Assemblea Costituente* in 1946.

A few others, like [Fabio Conforto](#) (1909-1954), remain loyal to [Mussolini](#) and fight against the Allied forces after their landing in Sicily.

[Giovanni Gentile](#) is executed by partisans in Florence in 1944.

About 7,000 Italian Jews perish in the [Holocaust](#).

## The aftermath: amnesty or amnesia? (cont.)

Shortly after the war, the new (democratic) government, with the support of the powerful Communist leader [Palmiro Togliatti](#), passed a sweeping [amnesty](#) that pardoned virtually all of the people who had been compromised through their association with the Fascist regime.

This pardon led to a swift reinstatement of many academics in the posts they held before and during the war. This is true even of the infamous [Nicola Pende](#) and [Sabato Visco](#), the primary authors of the *Manifesto della razza*.

[Severi](#), who narrowly escaped lynching at the hand of his fellow citizens of Arezzo in 1944, returned to his university chair in Rome and to the direction of the [INdAM](#), which was named for him after his death in 1961. Likewise, the [INAC](#) was named after [Picone](#) on the occasion of his 90th birthday in 1975.

## Concluding remarks

It is not always true that the presence of a totalitarian regime discourages science. In the [Soviet Union](#), for example, mathematics and physics were [greatly developed](#). [Biology](#), on the other hand, was more susceptible to the effects of ideology and was nearly destroyed. It has still to recover.

In Italy, the effect of Fascism on mathematics was [to accelerate an already latent decline](#). This was mostly due to the presence of a [rigidly hierarchical research organization](#), with most academic power concentrated in very few hands.

A result of this centralization was the [degeneration](#) of glorious scientific schools and traditions into provincial, cliquish groups centered around a dominant figure and closed, even hostile, to external influences.

In addition, [racial laws](#) forced a number of brilliant scientists to quit Italy. This was especially devastating for physics and biology. Mathematics also suffered, though perhaps less.



## Selected readings

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