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The UMI Archives – Debates in the Italian Mathematical Community, 1922–1938

Livia Giacardi (University of Turin, Italy) and Rossana Tazzioli (University of Lille, France)*

The Archives of the Unione Matematica Italiana (Italian Mathematical Union, UMI), located at the Dipartimento di Matematica of Bologna University, have recently been reorganised and will soon be opened to scholars.[1] They consist of two parts: a historical one covering the period from 1921 to the mid-fifties, and a modern one reaching from 1967 until today. This paper focuses on the historical part containing two sections: a first one with documents listed in the old inventory of the UMI Archives, concerning the years 1921–1933 and 1939–1943, and a second one kept in a box labelled "Correspondence relating to the Italian Mathematical Union 1938–1950. Do not open before the year 2000". The latter is a non-inventoried archive (sealed files, "fondo secretato") and contains 14 files from the years 1938–1952. It was forbidden to consult this section, most likely to avoid the premature disclosure of documents relating to UMI's unseemly reaction following the Racial Laws. This part mostly consists of the correspondence of Enrico Bompiani, vice president of the UMI from 1938 to 1948 and president from 1948 to 1952. In order to hide evidence that the UMI collaborated with the fascist regime, some documents have most probably been removed.

As we try to show in this paper, the documents of the UMI Archives highlight new significant aspects of the history of the UMI, in particular the attitude of the Italian Mathematical Union towards the fascist regime and the Racial Laws (1938), by enriching or completing the existing literature on the relationships between mathematicians and fascism.[2] They moreover provide useful information on the international context of the interwar period, when mathematicians tried with difficulty to reconstitute scientific internationalism interrupted by the First World War.

What is the UMI? Its foundation and first years

The history of the UMI begins in 1922. Unlike other national mathematical societies – such as the American, French, or the German mathematical societies (AMS, SMF, and DMV respectively) – the UMI was not born of the will of Italian mathematicians, but was an emanation of an international institution founded in 1920: the International Mathematical Union (IMU).[3]

Immediately after the First World War, in July 1919, the International Research Council (IRC) was set up in Brussels, excluding Germans and their former allies by the statutes. The IMU was officially founded on September 20, 1920 during the International Congress of Mathematicians (ICM) held in Strasbourg and, in accordance with IRC's regulation, excluded the former Central Powers from the organisation. The Belgian Charles-Jean de la Vallée Poussin and the Frenchman Gabriel Koenigs were elected president and secretary of the IMU respectively, while Vito Volterra and Émile Picard were among the honorary presidents.

Then professor at the University of Rome, Volterra was at the peak of his scientific and institutional career. A mathematician of high reputation throughout the world, nicknamed "Mister Italian Science", Volterra was vice president, and later president, of the prestigious Accademia dei Lincei. His role in the foundation of the UMI was significant, as he proposed to the Accademia dei Lincei, which accepted, the creation of a new Italian society of mathematicians. On 18 March 1921 Volterra informed Salvatore Pincherle, a specialist in functional analysis and professor at the University of Bologna, that the Accademia dei Lincei had designated him as president of the new society that would represent Italy in the International Mathematical Union.

With Volterra's agreement, Pincherle sent a circular in which he listed twelve crucial points of the new Union's program; among them we mention the following:

- To bring Italian experts in mathematics closer together;
- To encourage research on pure science;
- To reinforce relationships between pure mathematics and various branches of applied mathematics;
- To nourish interest in questions concerning mathematics teaching;
- To spread works and research of Italian mathematicians throughout foreign countries;

* We thank the CIRM of Trento for supporting our research with the project "Research in Pairs 2019".

1 See the website of the UMI: http://umi.dm.unibo.it/en/info-3/umi-historical-archive /; on Italian science archives see http://www.archividellascienza.org/en/.
We would like to thank the former UMI president, Ciro Ciliberto, the current president, Piermarco Cannarsa, and the treasurer Veronica Gavagna for allowing us to consult the Archive; we are also grateful to the archivist Alida Caramagno for her useful suggestions.

2 See for instance (Israel, Nastasi 1998), (Nastasi 1998), (Guerraggio, Nastasi 2005).

3 For more details on the UMI history see (Giacardi 2016), (Giacardi, Tazzioli 2018), (Giacardi, Tazzioli 2020), and (Pucci 1986), (Bini, Ciliberto 2018).

- To promote exchanges of mathematical books and journals in Italy and abroad;
- To organise national meetings on pure and applied mathematics.

Salvatore Pincherle (1853–1936)

Vito Volterra (1860–1940)

In order to attain these goals, Pincherle founded a new journal, the bi-monthly *Bollettino della Unione Matematica Italiana* (BUMI). In May 1922 Pincherle sent out another circular to the members of the new society and asked them to send brief reports of their work to the UMI, including the origin of their research problems, the problems to be dealt with, their principal results and a few details of their mathematical methods.

Thanks to the rich correspondence and the documents of the UMI Archives we can trace the history of the early years of the Italian Mathematical Union. We learn that at the beginning Pincherle had difficulties in convincing colleagues to join the new society. In fact, some of the most famous Italian mathematicians disliked the foundation of the UMI. As an example, we refer to a letter from the UMI Archives by Tullio Levi-Civita, professor at the University of Rome, arguably the leading player, along with Volterra, in Italian mathematics in the first decades of the twentieth century. Levi-Civita wrote to Pincherle on April 16, 1922:

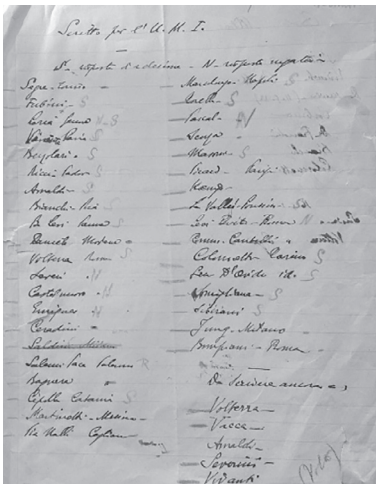
> *"Although all the aims that should have been pursued by the Union [UMI] were not covered by the Statutes of the Circolo Mat.[ematico] di Palermo, yet I cannot escape the impression that the true and desirable analogue of the "Société Math. de France", "American Math. Society", "Deutsche Math. Ver." etc. still is the Circolo, which really honored Italy, when Guccia was alive, it was in full working order. Why kill it or weaken it with a new society? Would it not be much better to invigorate it, and to continue it and exploit its good traditions and indisputable merits?"*

Therefore, according to Levi-Civita, the Circolo Matematico di Palermo (Mathematical Circle of Palermo), an international and highly reputed mathematical society in Italy and abroad, already played the role of an Italian mathematical society. Founded by Giovanni Battista Guccia in 1884, the Circolo had reached its zenith on the eve of the First World War. In the twenties, because of the catastrophe of the war and the death of Guccia in autumn 1914, the Circolo and its journal, the famous *Rendiconti del Circolo Matematico di Palermo*, showed signs of crisis (Brigaglia, Masotto 1982) (Bongiorno, Curbera 2018). Levi-Civita and other mathematicians preferred to attempt to revive the fortunes of the Circolo and its journal rather than create a new society that would, in their view, sink it definitively.

Another issue made Italian mathematicians wary of the UMI. Was this not an emanation of the IMU, an exclusionary organisation par excellence, the enemy of scientific internationalism by the statutes? In the same letter to Pincherle Levi-Civita claimed:

> *"The international union [IMU], to which the circular refers to (see point 6), is not actually international. […] It seems to me that this aspect of the [UMI] program should be clearly proposed in a way that leaves no room for doubt."*

Many other mathematicians – such as Guido Castelnuovo, Umberto Cisotti, Gino Loria, Corrado Segre and Giulio Vivanti – shared the same perplexities, as the correspondence contained in the UMI Archives shows. For example, on 17 April 1922 Castelnuovo, professor at the University of Rome, wrote to Pincherle that he did not understand "the urgent reasons that required the establishment of a general Union of mathematicians [UMI]", giving the same reasons as Levi-Civita did. And Segre, one of the main protagonists of the school of Italian algebraic geometry, in a letter to Pincherle dated May 9, 1922 threatened to resign from the UMI if it did not distance itself from exclusionary organisations such as the International Mathematical Union.



Pincherle's list of the Italian mathematicians in favour of the UMI or opposed to it: S (*Sì, Yes*) stands for in favour of, and N (*No*) stands for against the UMI (UMI Archives)

A success for Pincherle and the UMI: the Bologna ICM of 1928

Pincherle made huge efforts to defend the UMI project. He wrote numerous letters trying to convince his colleagues that the UMI was necessary and that the Bollettino was different from already existing journals, saying that both the Union and its journal would render a great service to Italian mathematicians. After a few months, in June 1922, there were 152 members, and membership reached 379 in 1924. Little by little, many of the math-

ematicians who had opposed the UMI joined it – such as Umberto Cisotti and Levi-Civita who became members in autumn/winter 1922-23, Federigo Enriques and Francesco Severi in spring 1923, and Guido Castelnuovo in 1926.

The most significant event of UMI's first years is the International Congress of Mathematicians held in Toronto in 1924. The correspondence of John C. Fields, the president of the organising committee and the founder of the Fields Medal for outstanding achievement in mathematics, offers evidence of the prominent role played by Italian mathematicians in the Toronto congress. On 17 July 1924 Fields wrote to the UMI secretary Ettore Bortolotti: "Yours' is the most brilliant delegation from Europe and it would be too bad if it did not remain intact". As other letters kept in the UMI Archives show, Fields travelled to Turin, Bologna and Rome to meet and invite eminent Italian mathematicians, or wrote to them. The Italian mathematicians who read short notes at the Toronto ICM were: Leonida Tonelli, Guido Fubini, Gregorio Ricci-Curbastro, Giovanni Giorgi, Giuseppe Gianfranceschi, Umberto Puppini, Corrado Gini, Ettore Bortolotti and Giuseppe Peano, while Severi and Pincherle gave two of the six plenary lectures and Puppini was allowed to deliver an hour-long lecture on applied mathematics.

In Toronto, many mathematicians did not agree with the IRC and IMU policy that excluded Germans and their former allies, and opposed the boycott of colleagues coming from the former Central Powers. Therefore, the American delegates presented a motion, endorsed by Italy, Netherlands Sweden, Denmark, Norway and the United Kingdom, asking the IRC to abolish the restrictions on nationality imposed by the post-war Council's rules. The motion was passed by the assembly.

The greatest Italian political success in Toronto was the election of Pincherle as president of the International Mathematical Union, while Koenigs was confirmed as general secretary. Moreover, the choice of Bologna for the following congress prevailed over that of Stockholm proposed by Gösta Mittag-Leffler. As the president of both IMU and UMI, Pincherle then began to work on organising the next ICM in Bologna.

In the meantime, the new international policy supported above all by the League of Nations led the IRC to organise an extraordinary assembly on June 29, 1926 where scientists from Germany and its former allies were invited to join the IRC and its Unions. However, Germany rejected the "invitation" and did not adhere to either the IRC or the IMU, as it demanded an "admission" by the statutes. This request was only satisfied in 1931. (Rasmussen 2007)

Pincherle decided to invite scientists from all nations without restrictions to the Bologna ICM. However, the question of inviting German mathematicians was problematic, as Germany belonged neither to the IRC nor to the IMU. The UMI Archives show how Pincherle was gradually led to the following expedient: although the invitation letters mentioned that the congress was linked to the IMU, they were signed by the rector of the University of Bologna who then "seemed" the real organiser. This deliberate ambiguity was immediately remarked upon by the French Picard and Koenigs. The latter wrote to Pincherle on May 29, 1928:

> *"Your letter of April 26 makes me aware of an event whose gravity you cannot certainly ignore, albeit in a watered-down form. Invited in June 1926 by the International Research Council to join it, the German and Austrian scholars did not respond to this act of high courtesy and openness; they refused to join the work of peace which all desire […]*
> *But leaving aside all questions of peace or courtesy, there is one that particularly complicates things and makes the situation very difficult. It is your benevolent consent to abandon all your rights as President [of the IMU] in favor of the University of Bologna and its Rector […]*
> *This grave shortcoming makes all invitations illegal."*

On the other hand, a group of German mathematicians, led by Ludwig Bieberbach from the University of Berlin, tried to discourage participation in the Bologna Congress. Bieberbach sent a letter to all German universities and secondary schools with a request to boycott the Congress. He reproached Pincherle and Bortolotti for not wanting to officially pull away from the IMU. Many documents of the UMI Archives concern the German boycott. Bieberbach wrote in a letter dated July 14, 1928 that although "the warm words with which you invite me to Bologna go straight to my heart", "there is still no clear separation between the congress and the Union [IMU] itself". He then declined the invitation by adding that "apart from the private difficulties, I also feel the weight of a charge of responsibility in the DMV and that my presence at the congress could be seen as if I were there representing the DMV"; he was indeed the DMV secretary.

Nevertheless, several German mathematicians, especially Hilbert and his colleagues at the University of Göttingen, supported the participation in the ICM of Bologna. Hilbert immediately accepted the invitation to give a general conference and planned to give a short political speech including the famous sentence: *Mathematics knows no race* (Siegmund-Schultze 2016). In a letter to Bortolotti on 23 May 1928, Richard Courant, professor in Göttingen, claimed: "I am very interested in restoring international relations between mathematicians from different countries". He added that German scientific societies and authoritative organisations (academies) were "reluctant to support the Conseil de Recherches [IRC] in its current form", although "according to us [mathematicians of the University of Göttingen] there would be no obstacle for the Germans if the congress were independent of the Conseil des recherches".

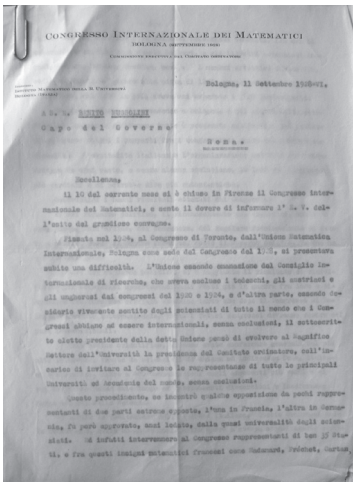
For months Pincherle had to mediate between French requests and German criticisms in order to avoid the boycott against the Bologna ICM. In the UMI Archives the correspondence between Pincherle and Ettore Bortolotti with Picard, Mittag-Leffler, Koenigs, Courant, Brouwer, Demoulin, Bieberbach and others testifies to this difficult mediation.

Finally, the international congress of Bologna was a success: 836 mathematicians from 36 countries participated, and around 80 were Germans. Guillermo Curbera denotes the congress as a fascist power "showcase". (Curbera 2009, p. 88) The young Hasso Härlen wrote a letter to Brouwer, in which he recognised Italian organisers' efforts for avoiding contrasts, but he highlighted a general lack of sensitivity towards Germans – for instance there were small Italian flags everywhere, not to mention the dreadful situation of the South Tirol where people were forbidden to speak in German and to teach German at school because Mussolini stifled any opposition by force. (Van Dalen 2011, p. 334–338)

The IMU General Assembly took place in Bologna unofficially because Koenigs refused to convene it. While Pincherle's work was unanimously approved, he was aware that he had not complied with the IMU rules and consequently resigned as its president. (Proceedings ICM 1928, p. 83)

Fascism and mathematics: new elements from the UMI Archives

The UMI Archives not only allow us to clarify administrative issues and difficulties due to international scientific policy, they also shed light on the attitude of mathematicians towards the fascist regime. In fact, the foundation of the UMI took place in a particular period of Italian history. It was founded in 1922, the year of the Rome march that inaugurated the fascist era. During the first years of the UMI, the fascist regime strengthened and showed its true face with the Matteotti assassination (1924). In order to attract intellectuals, the fascist regime developed a cultural policy and created institutions to further it. In 1925 the Istituto Nazionale Fascista di Cultura (National Fascist Institute of Culture) and in 1926 the Accademia d'Italia (Academy of Italy) were founded, followed by the new Istituto Centrale di Statistica (Central Statistical Institute) directed by Corrado Gini. Little by little, Volterra, who had always supported Pincherle as head of the UMI, lost all his institutional influence because of his opposition to fascism: in 1926 and 1927 he was replaced as the president of both the Accademia dei Lincei and the Consiglio Nazionale delle Ricerche (National Research Council, CNR) by Vittorio Scialoja and Guglielmo Marconi respectively.


CONGRESSO INTERNAZIONALE DEI MATEMATICI

BOLOGNA

Bologna, 13 Settembre 1928-VI.

A S. E. BENITO MUSSOLINI

Capo del Governo

Roma.

Eccellenza,

Il 10 del corrente mese si è chiuso in Firenze il Congresso Internazionale dei Matematici, e sento il dovere di informare l' E. V. dell'esito del grandioso convegno.

Fissato nel 1924, al Congresso di Toronto, dall'Unione Matematica Internazionale, Bologna come sede del Congresso del 1928, si presentava subito una difficoltà. L'Unione essendo emanazione del Consiglio Internazionale di ricerche, che aveva escluso i tedeschi, gli austriaci e gli ungheresi dai congressi del 1920 e 1924, e d'altra parte, essendo solidaria vivamente sentita dagli scienziati di tutto il mondo che i Congressi abbiano ad essere internazionali, senza esclusioni, il sottoscritto eletto presidente della detta Unione perché di evitare al Magnifico Rettore dell'Università la presidenza del Comitato ordinatore, nell'incarico di invitare al Congresso la rappresentanza di tutte le principali Università ed Accademie del mondo, senza esclusioni.

Questo procedimento, se incontrò qualche opposizione da pochi rappresentanti di due parti estreme opposte, l'una in Francia, l'altra in Germania, fu però apprezzato, anzi lodato, dalla quasi universalità degli scienziati. Ed infatti intervennero al Congresso rappresentanti di ben 35 Stati, e fra questi insigni matematici francesi come Hadamard, Drichet, Cartan,

Letter by S. Pincherle to B. Mussolini, Bologna, September 13,1928 (UMI Archives)

The UMI never reacted officially against fascist laws, not even against those that damaged science and, in particular, mathematics. As an example, in 1923 the neo-idealist philosopher Giovanni Gentile, as the Minister of National Education, completed a reform of the Italian education system at all levels in a single year by blatantly devaluating science. In spite of its statutes claiming the UMI was involved in questions related to mathematics teaching, the UMI did not take any official position against the Gentile Reform, and nothing about the following harsh debates appeared in the Bollettino. In contrast to this, the Accademia dei Lincei took a very strong stance regarding the reform, as did the Italian association of mathematics and physics teachers. No opposition to or debate about the Gentile Reform appears in the documents of the UMI Archives. This silence is probably one of the reasons why the government offered generous aid in 1924 when the UMI participated in the Toronto ICM. The interest of the fascist government was to show the image of the Italian genius ("genialità d'Italia") abroad, as the Minister of National Education, Alessandro Casati, who replaced Gentile from July 1924, wrote to Pincherle. Casati granted 20,000 Lire (about 18,000 Euros) to support participation in the congress, as evidenced in his letter to Pincherle dated July 19, 1924.

In April 1925 Pincherle signed the manifesto of fascist intellectuals – the so-called Gentile manifesto – during the first Congress of Fascist Cultural Institutes held in Bologna. Other and ever more numerous traces of subjugation to the fascist power can be found in the UMI Archives in the following years. In February 1926, Pincherle contacted Mussolini to obtain the necessary funding for the organisation of the Bologna congress. On December 7 Pincherle was received by the Duce, and significantly on December 31 joined the Partito Nazionale Fascista (National Fascist Party, PNF).

We point out that several sections of the Bologna ICM of 1928 dealt with applied mathematics in accordance with Mussolini's ideas on the importance of applied sciences and their relations with society. (Mussolini 1926, p. 30) Significantly, Pincherle offered the prefect of Bologna the right to choose the members of the honorary committee – Mussolini was asked to be the president, and several ministers of his government belonged to this committee. His accommodating attitude towards fascism led him to win the support of the government. Actually, the ICM received a huge contribution from the national government and the Ministry of National Education, and relevant support from political and cultural institutions of Bologna (municipality, university and province), as well as from various public and private entities. In more detail, the national government and the Ministry of Public Education gave 200,000 Lire (about 180,000 Euros today), and the municipality, province, and university of Bologna donated in total 125,000 Lire. (Proceedings ICM 1928, p. 18–19).

In his introductory speech to the congress, Pincherle bestowed lavish praise on the Duce's work. (Proceedings ICM 1928, p. 73) On September 13, 1928 he addressed a letter to Mussolini reporting on the huge success of the congress from different points of view:

> *"In political terms, the most explicit recognition came from all sides, and concerns the order, the well-being, the regular functioning of all the services under the*

Fascist regime, under the Government of the E. V. [Eccellenza Vostra e.g. Mussolini] who is its founder. In the political sphere, too, the result was achieved to bring scientists from countries previously at war with each other back to cordial harmony; so much so that after the truly international Bologna Congress, all future congresses will have to be equally international. From the scientific point of view, there were general lectures of the highest interest, held by scientists of clear and undisputed fame, Italians and foreigners [...] Finally, the exaltation of Italian science. This Congress – in lectures, in communications, in printed works written for this occasion and given as a gift to the participants – shed the clearest light to our results obtained in the last fifty years and to the immense contribution of Italy to the shaping of modern mathematics."

In the UMI Archives there are neither documents nor letters nor assembly reports that show a real opposition to the fascist policy. There was no official opposition and only a few examples of passive resistance even emerged even in the later period, during which the fascist laws further limited freedom of individual and association. In 1931 the government imposed a requirement on professors to swear an oath of allegiance to fascism; Volterra was the only mathematician who refused. Nothing about this event emerges from the UMI Archives. There is no trace even of another crucial law promulgated by the government in 1934: the statutes of the UMI were modified and limited the freedom of the UMI and its members. The new statutes subordinated the appointment of the UMI president and vice president to the assent of the Minister of National Education. No cry for alarm arose even in 1936 when the UMI was not allowed to participate in the ICM in Oslo, despite the fact that Severi had been invited to hold a plenary lecture. (BUMI 15, 1936, pp. 96–97) The reason was that Norway was a country that, following the directives of the League of Nations, sanctioned Italy in response to the attack on Ethiopia.

The attitude of acquiescence of the UMI towards the government continued without interruption. The first UMI Congress held in Florence in 1937 confirms this attitude. There was opportunistic behaviour in the exaggeratedly celebratory tones of the inaugural speeches and in the choice of giving ample space to applied mathematics according to the wishes expressed by the government: 4 out of 8 sections – probability; astronomy, geodesy, optics; aerodynamics; hydraulics. In their introductory speeches, the rector of the University of Florence, Giorgio Abetti, and the president of the UMI, Luigi Berzolari, exalted the work of the regime and emphasised the greatness of the Duce who was the "omnipresent, wonderful architect of the national renaissance". (Proceedings UMI 1937, p. 9, 12) Even Severi, in the plenary conference entitled "Pure science and applications of science", enthusiastically praised Mussolini. In particular, he claimed that mathematicians were ready to collaborate "for getting the maximum of national autarchy". (Proceedings UMI 1937, p. 23) The plenary lectures highlighted the important contributions of Italian mathematics to some crucial sectors: Bompiani spoke about the modern developments of differential projective geometry, Tonelli illustrated the recent Italian contributions to the calculus of variations, and Scorza lectured on the theory of algebras that had recently received an impressive development in Germany and the US.

Racial Laws and the UMI

1938 is a key year for the history of fascism and the UMI. In the summer the newspaper Il Giornale d'Italia published the "Manifesto of Racial Scientists", which established the foundations of fascist racism. After claiming that human races existed and that the concept of race was purely biological, the "racial scientists" declared that the "pure Italian race" had to be preserved. Following this and other actions of racist propaganda the Racial Laws were promulgated by the government from September to December 1938.

In spring 1938 there was an important event for the mathematical community: the elections of the UMI executive board. The result was clear: Berzolari was elected president and Pietro Burgatti vice president. The latter, however, died suddenly on May 20, leaving the position of vice president vacant. The election result was submitted to the Minister of National Education, Giuseppe Bottai, who exercised his power by confirming Berzolari president, and appointing Bompiani vice president, although the latter obtained only 8 votes – Guido Fubini got 74 votes and Annibale Comessatti 61. Moreover, Bottai excluded all Jewish mathematicians from the UMI scientific commission– B. Segre, B. Levi, Fubini and Levi-Civita who got the most votes. (BUMI 17, 1938, pp. 140–141)

Enrico Bompiani (1889–1975)

It was not just by chance that Enrico Bompiani was appointed vice president by ministerial order. A mathematician of strong reputation, he had obtained the prestigious gold medal of the Accademia dei XL in 1926 and the "Premio Reale" of the Accademia dei Lincei in 1935. Bompiani, who had been the secretary of the CNR mathematical committee since 1926, exercised great power in the CNR, as evidenced by the documents contained in the Fondo Bompiani at the Accademia dei XL in Rome. He aspired to obtain a prestigious position in the UMI as well. As the correspondence in the UMI Archives shows, Bompiani actually influenced UMI's policies after 1934, when Luigi Berzolari replaced Pincherle as the UMI president. Also, there is evidence in the archives that Bompiani, directly or indirectly, manipulated his appointment to UMI vice president in the 1938 elections after Burgatti's death. On May 22, 1938, in fact, the UMI secretary and his close friend Ettore Bortolotti advised him to tell the Minister not to

take the second or third rankings into account "but to certainly make your [i.e. Bompiani's] appointment", in order to do "good work, for our union and also for Italian culture".

On October 19 Berzolari addressed some critical words to Bompiani:

> *"I am very happy to have you as a collaborator in the exercise of the "power"; I would not like to know the reasons that led the Minister not to follow the appointment of the Union […] by choosing you who had 8 votes, instead of Comessatti, who had 61."*

Even before the Racial Laws, Bompiani exchanged confidential letters with several of his colleagues that were clearly anti-Jewish, especially regarding the UMI administrator Beppo Levi, professor at the University of Bologna and at that time a member of the Bulletin editorial board and of the UMI Scientific Commission. In a letter dated July 27, 1938 Bompiani wrote to Ugo Bordoni, the president of the CNR committee for physics and applied mathematics, that Levi and his colleague Beniamino Segre were "the two real puppeteers" of the UMI. Actually, Berzolari had always tried to defend the work of Beppo Levi from Bompiani's attacks, but only in private. For example, in a letter of January 7, 1938, he wrote to Bompiani:

> *"It would seem to me a lack of honesty, if no word in his favor [i.e. Beppo Levi] is said […] He is a person of genius and has a very wide mathematical culture […] he has always carefully read all the works sent for printing in the Bollettino, and if they do not contain mistakes, Levi should deserve all the praise: I can assure you that I will never find a person as agile, patient, disinterested as he is."*

From autumn 1938 Bompiani, as UMI vice president, immediately set to work to implement the new Racial Laws; he wrote to Berzolari on October 28, 1938:

> *"It seems appropriate to me if you sent a circular to the UMI members explaining their own responsibility – and making them feel proud – which derives from the recent racial decrees. These decrees commit each one to give the maximum contribution in order that no domain of Italian culture can suffer a decrease. The great founders of Italian mathematics, who created research fields where nothing existed and led them to a leading position, were not Jews (BETTI, BELTRAMI, BRIOSCHI, CASORATI, DINI, CREMONA etc): their names must give young people the confidence of being able to continue this excellent tradition exclusively with Italian forces."*

One month later, on November 24, 1938 Berzolari wrote to Bompiani informing him that "the names of the Jews were canceled in accordance with the measures taken by the Government. The list will appear in the issue [of the BUMI] that will be published in a few days."

On December 10, 1938, the UMI Scientific Commission met in Rome. As reported in the proceedings, "after a friendly, exhaustive discussion" and refusing "all solidarity with teachers and colleagues", (Pucci 1986, p. 210) the UMI assembly actually supported the fascist government by claiming that:

- Italian mathematics is the creation of Aryan scientists;
- Italian mathematics, even after its decimation, preserves the conditions for its development and, in any case, is able to cover vacant positions;
- No vacant mathematics professorship due to the Racial Laws must be subtracted from the mathematical disciplines.

Bompiani insisted on rejecting articles by Jewish authors for the Bollettino; an attitude even more intransigent than the fascist government, as Berzolari pointed out in a letter on January 24, 1939:

> *"The annoying question is the Jewish one. As a first remark, I believe that if the Government – which decided the appointments of the [UMI] President and Vice-President, and the Scientific Commission – did not want Jewish works to be published in Italian periodicals, it would have told us: instead I have never received any orders about that."*

A few months later, in another letter to Bompiani on March 9, 1939, Berzolari reiterated his opinion:

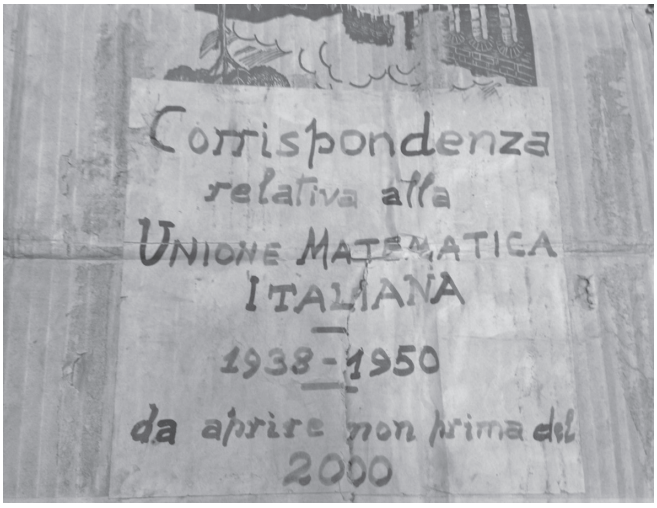
> *"As for the fact that F. [probably Bruno Finzi] belongs to Jewish race, I do not see why we must be more intransigent than the government, which has maintained him as a teacher and as a member of the Ist. Lomb. [Istituto Lombardo]. Can't he publish his works in Italian journals?"*

Meanwhile, as a result of the Racial Laws, Beppo Levi and Beniamino Segre, like many others Jewish mathematicians, were forced to leave the UMI, as well as the University of Bologna and were forced into exile abroad, the former in Argentina and the latter in England.

The Italian mathematical community was one of the most affected by the effects of the Racial Laws – the UMI expelled 22 members, 10% of the total – and Italian universities had to face the non-trivial problem of replacing the vacant positions left by 96 full and extraordinary professors, over 141 assistants and several dozens of lecturers, and at least 207 university assignments that were revoked. (Sarfatti 2018, p. 218) Some letters show the awareness that the expulsion of many high-level Jewish mathematicians had weakened Italian mathematics. For example, on July 21, 1939 Bompiani wrote to Sabato Visco, the director of the Institute of General Physiology of the University of Rome:

> *"Mathematics is one of the areas most affected by Judaism; and our will is not enough to defend it, but we also need the means (which, moreover, are limited)."*

It is also worth mentioning that after the agreement between Italy and Germany signed in autumn 1936, the Rome-Berlin Axis, the Italian and German mathematical societies (UMI and DMV) sought a way to cooperate and Bompiani had a very active role – like his German colleagues Harald Geppert and Wilhelm Süss had. (Remmert 1999) (Remmert 2017) Bompiani's engagement continued in organising the Second UMI Congress that took place in Bologna in 1940, giving lectures on mathematics in Germany and in other countries of the Axis and holding courses in the Istituto Nazionale di Alta Matematica (National Institute of High Mathematics, INDAM) founded by Severi in Rome in 1939 with the support of the fascist government.



Label on the box bearing the words "Correspondence relating to the Italian Mathematical Union 1938–1950. Do not open before the year 2000" (UMI Archives)

Conclusion

To conclude, our research based on the documents of the UMI Archives sheds light on both "theoretical" and "practical" aspects of the UMI policies towards the fascist government. (Capristo 2013) Theoretical aspects refer to the ideological support to the regime through, for example, the celebration of the Duce's extraordinary abilities and far-sighted generosity towards sciences. But it is above all the practical aspects that emerge and that were implemented by personal or collective behaviour in the face of bureaucratic procedures; they actually allowed fascist legislation, particularly the Racial Laws, to have an extremely effective application.

We met figures like Bompiani, Ettore Bortolotti and others, who were not true persecutors, but who supported and strictly followed, sometimes with "zeal", the procedures imposed by the government for personal ambition, or for preserving mathematics chairs, or for envy or revenge against Jewish colleagues. Others, like Berzolari, were simply "aligned". (Capristo 2013) They were often aware of the illegitimacy of certain laws and expressed their disappointment in private. Therefore, they were able to be indignant but not actually to rebel publicly, either because they were manipulated or because they could not understand that "the great and irremediable evils depend on the indulgence towards the evils still small and remediable". (Foa 1996, p. 151) Finally, there were those, probably most of Italian mathematicians, who obeyed without even getting angry. All these "bystanders", according to the historian Raul Hilberg, were also responsible for the anti-Jewish persecutions, and deserve to be studied as the persecutors and their victims. (Hilberg 1992)

So the UMI Archives are a useful research tool for reconstructing the attitude of mathematicians towards fascism. However, these archives only concern mathematicians who had a significant role in the UMI and therefore a small part of the Italian mathematical community. In particular, they contain only a few documents concerning two of the most important mathematicians of the fascist era, namely Francesco Severi and Mauro Picone. This is the reason why the documents from the UMI Archives should be integrated with those from other Italian and foreign archives. Further research should be done to give a more faithful image of the relationships between Italian mathematicians and fascist regime, as well as other European scientific communities. As Severi's papers have not been preserved, documents concerning his political and institutional activity are scattered either in personal funds or in institutional archives such as the Archivio Centrale dello Stato (Central State Archives, ACS) in Rome. For instance, Severi asked Gentile to submit to the Grand Council of Fascism a new formula of oath of allegiance to the Fascist Party that suggested a political line that would be successful. He indeed proposed a sort of "regularization of political acts happened a long time ago" – for those in particular who, like him, had signed the anti-fascist manifesto of 1925, but then became supporters of the regime. Severi's request is expressed in a letter dated February 15, 1929 preserved in the Gentile papers (published in (Guerraggio, Nastasi 2005, p. 101–102)).

Mauro Picone was a member of the UMI scientific commission and at the same time directed an important CNR institute, the Istituto Nazionale per le Applicazioni del Calcolo (National Institute for Calculus Applications, INAC). Fortunately, Picone's documents and letters are kept in the Archivio Storico of this institute, and give a lot of detailed information about Picone's activity during fascism. (Nastasi 2007)

Other interesting documents concerning the attitude of mathematicians towards fascism can be found in personal archives, such as Volterra's papers and Levi-Civita's papers both at the Accademia dei Lincei in Rome, Sansone's papers at the University of Florence, or Marcolongo's papers at the Dipartimento di Matematica, University "La Sapienza" of Rome and others that should still be explored.[4]

Here we have focused our attention on a particular aspect of the research, that is how to use the UMI Archives to reconstruct the history of a crucial period of this institution and its interactions with fascism, but the

[4] In particular, we can mention the personal archives of Alessandro Terracini (Department of Mathematics, University of Turin), and Gustavo Colonnetti (Archivio di Stato of Turin).

UMI Archives, complemented by other Italian archives, are also relevant from a different perspective. In fact, further studies could help historians of mathematics to establish the influence of political events on Italian mathematics specifically. One might wonder, for instance, if the fascist regime produced a real isolation of Italian mathematics in the thirties that could have contributed to the decay of the Italian school of algebraic geometry. And this despite the fact that Francesco Severi, one of the prominent figures of this school, succeeded in founding the Istituto Nazionale di Alta Matematica in Rome thanks to the support of the fascist government. Furthermore, did some disciplines benefit from a favourable political climate for their development? For example, the implication in the fascist politics of Mauro Picone, director of the Institute for the Application of Calculus, together with the extraordinary applications of calculus to other sciences, could explain the extraordinary development of numerical analysis already in the Thirties. On the other hand, some disciplines may have suffered as a result of the political climate and the consequent expulsion of many Jewish mathematicians from Italian universities. For example, Levi-Civita's excellent scientific research, especially in the field of mathematical physics, abruptly stopped in 1938, when he was made to retire and replaced by his pupil Antonio Signorini, whose scientific stature was decidedly inferior.

We hope that this research will help institutions to become aware that it is important to recover and digitalise historical archives in order to create a network connecting them to each other for a better understanding of history.

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