Alessandro Terracini (1889–1968): Teaching and Research from the University Years to the Racial Laws

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Abstract Alessandro Terracini's life is divided into three main phases; each of them has different characteristics and is framed in different historical and social scenarios. He was trained in the School of Corrado Segre in Turin, and from the time of his degree dissertation, he was directed by him towards differential projective geometry, the field in which he would make the most significant contributions. In this essay, the scientific biography of Terracini during the first phase of his life is reconstructed, based on extensive unpublished documentation: scientific results and contacts, his participation in World War I, his teaching experiences in Modena and Catania, his return to Turin, and, finally, the dramatic experience of racial laws and the consequent decision to emigrate to Argentina with his family.

Abbreviations

ABTT	Archivio privato famiglia Benedetto Terracini, Torino
ACS-Roma	Archivio Centrale dello Stato Roma
ASUCT	Archivio Storico dell'Università degli Studi di Catania
ASUT	Archivio Storico dell'Università di Torino
BSMT	Biblioteca Speciale di Matematica 'G. Peano', Dipartimento di Matematica, Università di Torino

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SPSL, *AT*   Archive of the Society for the Protection of Science and Learning, Bodleian
               Library, University of Oxford, I. Correspondence relating to individual scholars,
               I.12 Mathematics, *Terracini, Professor Alessandro (1888–)*, File 1938–46, 285/5,
               fols. 340–87

1   Introduction

> A serious world, almost ready for grandeur, of silent streets and palaces of the last
> century, very aristocratic ... High civilization of cafes, ice cream, Turin chocolate. Trilin-
> gual libraries. University, good library ... City with splendid boulevards; incomparable
> landscapes on the banks of the Po. ([32], III5, p. 313)

With these words, Friedrich Nietzsche, who settled in Turin in 1888, described
with almost pictorial tones the austere beauty of the city that hosted him and the
strong cultural dimension that characterized not only the academic sites, but also
the libraries and discussions in cafes.

Indeed, the scenario that presented itself to anyone traveling through the history
of the subalpine capital in the last 20 years of the nineteenth century was that of
a city in full turmoil in both the scientific sector and in the humanities: schools of
thought developed, new journals were created, growing need to integrate scientific
research and popularization fostered debates, and collaboration between universities
and industry began.

Among the avant-garde sectors at the end of the century, mathematics certainly
occupied a prominent place: in the Piedmont capital, three scientific schools of
international importance flourished simultaneously, the Italian school of geometry
of Corrado Segre (1863–1924), that of mathematical logic of Giuseppe Peano
(1858–1932), and that of mathematical physics of Vito Volterra (1860–1940).

These stimulating years are the setting for Alessandro Terracini's training at the
school of Corrado Segre at Turin University (Fig. 1).

2   Training, First Works, and First Scientific Contacts

Terracini was born in Turin on October 19, 1889, in a wealthy Jewish family.
The Turin Jewish community at the end of the nineteenth century was a large,
cultured, and productive group that included representatives of the rich bourgeoisie,
of the world of culture—university professors, teachers, and managers—and of the
publishing industry and was an active part in the impetuous scientific development
and cultural heritage of the city [24]. Terracini's father, Benedetto, was a wealthy
merchant, but died when Alessandro was just 10, leaving the family management in
the hands of his wife Eugenia Levi, a woman of great energy.

Alessandro began his secondary studies in 1899 at the Ginnasio Liceo D'Azeglio
and continued them at the Ginnasio Liceo Cavour, where he had Rodolfo Bettazzi,

the founder of the National Mathesis Association of mathematics teachers, as his math teacher. He was a brilliant student and collected prizes throughout his school career, which ended in 1907 with a school leaving certificate with honors.

As a student, he already showed a strong propensity for mathematics and engaged in the problems proposed by three journals, *Supplemento al Periodico di matematica*, *Il Pitagora*, and *Mathesis*, a Belgian periodical, earning the praise of the editors of the columns for some of the solutions sent by him.[1] Among these, the extensive treatment of a particular problem on triangles aroused the admiration of Cristoforo Alasia, known precisely for his research on the geometry of the triangle:

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[1] Questions solved in the *Supplemento al Periodico di matematica*: from January 1905 to December 1906, the young Terracini sent the solutions to the following: games 200, 198, 202, 206, 203, 210, 212, 219, 220, 221, 227, 197, 205, 208. 225. 226, 222, 228, 232, 229, 233, 242, 243, 246, 244, 245, and 252; questions sent for competitions 56, 57, 59, 60, 64, 62, 65, 66, and 67; and questions 622, 624, 627, 628, 643, 644, 633, 634, 666, 672, 674, 676, 682, 680, 702, 704, 705, 808, 706, 712, 714, 707, 717, 720, 724, 727, 729, 722, 723, 733, 735, 725, 736, 739, 709, 715, and 716. Issues resolved in *Il Pitagora*: in 1904–1905 (year XI), he sent the solutions to questions no. 750, 753, 754, 755, 766, 772 (in issues 3–4–5), 776, 777, 778, 782, 783, 784, and 785 (in issues 6–7). Questions solved in *Mathesis*: from December 1906 to March 1908, he solved questions 1587, 1573, 1591, 1604, 1682, and 1641 and two of his notes, "Note sur les coniques" (VII, 1907, pp. 42–44) and "Théorèmes sur les transversales" (VII, 1907, p. 127), were published.

> The work of Mr. Terracini is the most extensive, as he wrote about 80 pages and in various points is not without merits that demonstrate that he has a broad spirit of observation and great ease of deduction, showing he must profitably have read more than one work on the recent geometry of the triangle.[2]

Many years later, his friend Eugenio Togliatti, referring to this youthful contribution by Terracini, wrote: "I then felt a sense of admiration for this then unknown companion who had been able to find so many properties of triangles that were so particular that they almost filled a volume."[3]

Right from the time of high school, Bettazzi, recognizing Alessandro's qualities, had put him in contact with Corrado Segre, the professor of Higher Geometry at the University of Turin, who in the early twentieth century, together with his students, had already acquired international fame. It is therefore natural that, having finished his secondary studies on October 31, 1907, Terracini enrolled in the degree course in mathematics at Turin University. Here, he attended the courses of E. D'Ovidio, G. Fano, G. Sannia, G. Peano, C. Somigliana, T. Boggio, and E. Laura, and for his personal interests, he attended Segre's higher geometry courses for three consecutive years, devoted, respectively, to *Rassegna di concetti e metodi della Geometria moderna* [Review of concepts and methods of modern geometry] (1908–1909); *Superficie del 3° ordine e curve piane del 4° ordine* [third-order surfaces and fourth-order plane curves] (1909–1910); and *Le curve e le superficie algebriche, dal punto di vista della Geometria delle trasformazioni birazionali* [Algebraic curves and surfaces, from the point of view of the geometry of birational transformations] (1910–1911).[4] In his autobiography, Terracini recalls:

> CORRADO SEGRE's lectures were usually only attended from the third year of university, but I began to attend them in the second year, that is, in 1908–1909. They were held on Tuesday, Thursday and Saturday morning from 10 to 11, formerly on the first floor in the hall that occupied the place then taken by the room that currently precedes the *aula magna*, and later, I believe, in room XVII on the second floor of the University Building in Via Po, around the walls of which there ran the glass cabinets with the geometrical models of BRILL which later, I think, were destroyed in a bombing.[5]

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[2] Cf. [1]: *Il lavoro del sig. Terracini è il più voluminoso avendo egli scritto circa 80 facciate e in diversi punti non è privo di pregi che dimostrano come in lui è un largo spirito di osservazione e molta facilità di deduzione, e come debba aver letto con profitto più d'un lavoro sulla recente geometria del triangolo.*

[3] Cf. [61] on p. 398: *Provai allora un senso di ammirazione per questo compagno allora sconosciuto che aveva saputo trovare tante proprietà di triangoli così particolari da riempire quasi un volume.*

[4] ASUT: Scienze MFN, Registro Carriera, matr. 1201–1402, *AT* p. 178; see also [58], p. 11, and http://www.corradosegre.unito.it/I21_30.php, in [17].

[5] Cf. [58], p. 10: *Le lezioni di CORRADO SEGRE—ricorda Terracini—si seguivano di regola soltanto a partire dal terzo anno di università, ma io incominciai a frequentarle nel secondo anno, cioè nel 1908–1909. Esse avevano luogo il martedì, giovedì e sabato mattina dalle 10 alle 11, anticamente al primo piano nell'aula che occupava il posto preso poi dall'attuale antiaula magna, e più tardi, credo, in quell'aula XVII del secondo piano del Palazzo Universitario di via Po, alle cui pareti correvano gli armadi a vetri coi modelli geometrici di BRILL che poi, penso, andarono distrutti in un bombardamento.*

His passion for geometry also led him to choose from the two subsidiary courses held by Gustavo Sannia, devoted, respectively, to analytical geometry and non-Euclidean geometries. Since the first months of university, the desire to try his hand at research led Terracini to send Alfredo Capelli, the editor of the *Giornale di Matematiche*, his first scientific note dedicated to an "extension (spontaneous, but certainly not peculiar) of the well-known hemi-symmetric determinants, to which the determinants in question can be traced back when the 'modulus' λ becomes equal to zero," [6] a note published in 1909 [41]. However, he was soon attracted to a new field of research for which Segre was laying the foundations in those years, hyperspatial differential projective geometry.[7] Segre, in addition to being a "great geometrician," was also an attentive and conscientious teacher and "assigned degree theses in writing with a long and detailed explanation of the state-of-the-art of the issue that the graduate student had to deal with ... he examined them quite often, always formulating in writing his criticisms and any advice for continuation."[8]

So, Terracini asked Segre for a thesis and was assigned a topic of differential projective geometry as the subject of study; in particular, it was a question of establishing a connection between two classes of hyperspatial varieties, thus connecting together two problems that, in particular cases, had already been studied by Francesco Severi and Gaetano Scorza. He solved the problem brilliantly and arrived at an important result, known as the *Terracini Lemma*.[9]

In the spring of 1910, Guido Castelnuovo, who was teaching at the University of Rome, informed Segre that his pupil Enrico Bompiani, same age as Alessandro, was preparing a thesis on hyperspatial differential projective geometry, and so the two young people came into contact through their thesis supervisors, although they only met in 1912 on the occasion of the International Congress of Mathematicians in Cambridge. On 5 July 1911, Terracini got his degree with 100/100 *cum laude*[10] presenting a thesis *Sulla teoria delle varietà luoghi di spazi* [On the theory of the varieties of linear spaces], part of which was published in the same year in *Rendiconti del Circolo matematico di Palermo* [42]. This was soon followed by other works on differential projective geometry (Fig. 2).

Barely a year after graduating, Terracini, then an assistant to Gino Fano, took part in the International Congress of Mathematicians held in Cambridge (UK) from 22

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[6] *Ibidem,* p. 8: *estensione (spontanea, ma non certo peregrina) dei notissimi determinanti emisimmetrici, ai quali i determinanti in esame si riconducono quando il 'modulo' λ diventa eguale a zero.*

[7] Cf. in particular the paper by Segre [38].

[8] Cf. [58], pp. 12, 13, and 14: *assegnava le tesi di laurea per scritto con una lunga e particolareggiata esposizione dello stato in cui si trovava la questione che il laureando doveva trattare [. . .] le esaminava abbastanza spesso, formulando sempre per scritto le sue critiche ed eventuali consigli per la continuazione.*

[9] See the three essays on Terracini's mathematical work [13], in particular §2 of the essay by Ciro Ciliberto [12]; §3.2 of the essay by Alessandro Verra [65]; and §4 of the one by Anna Fino [15].

[10] ASUT: *Verbale dell'esame di laurea di Alessandro Terracini. Torino, 5 luglio* 1911, Faculty of Mathematical, Physical and Natural Sciences, Graduation exam reports, 1902–1921, p. 141.

Fig. 2 ASUT, Minutes of the graduation exam by A. Terracini

to 28 August 1912. The fact that Segre, Castelnuovo, and Federigo Enriques were members of the International Committee was an incentive to participate. In addition, Bompiani gave a talk on *Recenti progressi nella geometria proiettiva differenziale degli iperspazi* [Recent advances in the differential projective geometry of hyperspaces] ([36], vol. II, 22–27). In it, Castelnuovo's young disciple extensively cites Segre's works and also Terracini's research deriving from his degree thesis. There thus began a friendship between the two mathematicians that was to last a lifetime, despite the break due to the racial laws, and one which was to extend to their families. During the congress, Alessandro also had the opportunity to personally meet Enriques, Castelnuovo, and Francesco Severi, the formidable trio of the Italian School of Algebraic Geometry, and other illustrious mathematicians. He wrote:

> Among the mathematicians I met in Cambridge I was particularly struck by the venerable MITTAG-LEFFLER (1846–1927) and Prof. EDMUND LANDAU (1877–1938) and, as for the places, the solemn environment rich in historical memories, and the austere rooms of the Colleges left an indelible memory.[11]

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[11] Cf. [58], p. 69: *Tra i matematici visti a Cambridge mi fecero particolarmente impressione la veneranda figura di MITTAG-LEFFLER (1846–1927) e il prof. EDMUND LANDAU (1877–1938) e, quanto ai luoghi, mi lasciarono un ricordo incancellabile l'ambiente solenne e ricco di ricordi storici, e le sale austere dei Colleges.*

The common interests with Bompiani stimulated the beginning of a scientific correspondence in which the two young people shared their research ([33], pp. 98–106). They thus realized that these presented some points of contact. Bompiani wrote in this regard:

> I note from your letter that the results we have achieved are identical; but the simultaneity, the difference in method and the probable differences in development give us the same merit and we shouldn't be too sorry about having met.[12]

They met in Bologna to discuss their research in person,[13] and they decided to publish their works together. These were presented by Segre for publication in the *Atti della Accademia delle scienze di Torino* in November 1913.[14] A new field of research was being developed, hyperspatial differential projective geometry, in which Segre, Bompiani, and Terracini gave internationally known results, which Terracini was to summarize in 1927 in Appendix III to the second volume of the treatise by G. Fubini and E. Čech, *Geometria proiettiva differenziale* [Differential projective geometry] [49]. Many years later, Bompiani in a lecture given at a meeting of the Mathematical Association of America was proud to evoke these first steps: "In this new field, in which almost nothing was known, began to work Terracini and myself."[15]

In the curriculum that Terracini presented to the Society for the Protection of Science and Learning in London to find a place to go after the enactment of the racial laws, he writes about the group of his works in this area:

> The moment I began to undertake my researches on projective differential Geometry happened to coincide with the years in which this branch had just left its initial period. Some of the methods were already formed and had been put to the test through the easier problems which always present themselves at the dawn of a new theory; the opportunity of contriving other methods was still kept for the future. Among the first the most important was doubtless the method based on the use of linear partial differential equations. This method was already classical for the curves, and Wilczynski had successfully employed it in the theory of surfaces. But it is with the consideration of loci in hyperspaces that the most interesting problems arise. I have endeavoured to use such a method to confront the manifold new problems which presented themselves. If the number of linearly independent equations (of second order) exceeds a certain limit, Corrado Segre had shown that the V_k belongs to certain well determined classes, and precisely that the dimension of the locus W of its tangent spaces S_k is $<2k$. But this condition remained, so to say, merely nominal, until the V_k for which the dimension of the locus W is $2k$ were effectively known. I succeeded in

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[12] E. Bompiani, to A. Terracini, [Roma] 25 February 1913 [33], p. 101: *Rilevo dalla tua lettera l'identità dei risultati da noi raggiunti; ma la contemporaneità, la differenza di metodo e le probabili diversità di sviluppo ce ne lasciano ugual merito e non c'è da dolersi troppo d'esserci incontrati.*

[13] See in particular E. Bompiani to A. Terracini, Roma, 5 March 1913; A. Terracini to E. Bompiani, Torino, 21 June 1913 in [33], pp. 102, 103–104.

[14] Cf. the paper [5] by Bompiani and the paper [43] by Terracini, work completed by *Nota II e III* in vols. 51 and 55 of the *Atti della Accademia delle scienze di Torino*.

[15] Cf. [7], p. 94. On Bompiani's first research in the field of differential projective geometry, cf. [11].

specifying the whole class of such V_k. Moreover, the same condition even being necessary is not always sufficient that the number of linearly independent partial equations exceed the mentioned limit. What are the cases when it is not sufficient? This is the main question which I have studied in 8,15. But to this purpose it has been necessary for me to reach many fundamental results about the manner of interfering of the structure of the system of partial equations with the geometric nature of the V_k. I have also observed that the number of linearly independent equations represented both by a V_k and by its generical prime sections may present some irregularities: for what loci does it happen so? (8,19).[16]

It was Segre who had pushed Terracini towards this sector of research and from Segre he took the mentality, the method, and the lines of research, but he also considered himself a pupil of Fubini even though he had never attended his courses ([58], p. 53). Although Fubini was predominantly an analyst in geometry too, "he did extremely important work," as Terracini writes, "discovering new geometrical facts with analytical methods … he was such a skilled tailor that, at the same time as the garment [analytic treatment], he created the person for whom it was intended [new geometrical fact]."[17]

While making use of the analytical tool (differential forms, systems of partial differential equations), Terracini, like Segre, always gives a lot of weight to the geometrical vision of problems, "to which there is linked," as Togliatti writes, "in harmonious collaboration, the analytical tool which for him has not only a control function, but also has a constructive part in research,"[18] creating a fruitful fusion between the analytical method and the synthetic method. Terracini honored his two masters throughout his life with articles and courses and by editing part of their works.

3   Participation in the Great War and First Appointments

In the years between 1912 and 1914, Terracini traveled, met various mathematicians, and established new relationships. As he tells us in his scientific autobiography ([58], chapter IX), in February 1912 in Erlangen, he met Max and Emmy Noether, and in the summer of the same year, he began his friendship with Eugenio Togliatti, who had just graduated with Segre as his supervisor and with whom he shared research interests in the field of differential projective geometry. In that period, he met Castelnuovo in Rome several times to discuss his current research and, during a stay in Parma, he met Beppo Levi and Gaetano Scorza. In July 1914, he went

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[16] SPSL, *AT*: Terracini, A., Some Indications on my scientific papers, folios 369–377. Notes 8, 15, and 19, to which Terracini is referring, are those cited in note 16.

[17] Cf. [56], p. 101: *ha fatto opera estremamente importante scoprendo fatti geometrici nuovi con metodi analitici [. . .] era un sarto tanto abile che, allo stesso tempo che la veste [trattazione analitica], creava la persona a cui era destinata [fatto geometrico nuovo]*; see also [58], p. 59.

[18] Cf. [62], p. 147: *alla quale si collega in armonica collaborazione lo strumento analitico con un ufficio che per lui non è solo di controllo, ma ha anche parte costruttiva nelle ricerche.*

to Athens, where he visited Cyparissos Stephanos, who was known to the Turin School[19] and whom Terracini had already met on the occasion of the International Congress of Mathematicians in Cambridge in 1912.

In 1914, the First World War broke out. In May 2015, after the London Pact, which marked the adhesion of Italy to the Entente (England, France, and Russia), Italy went to war against Austria. Terracini, like other important Italian mathematicians, such as Vito Volterra and E. Elia Levi, was "clearly in favor of Italy's intervention in the war."[20] In his autobiography, he tells us in great detail about his and his brother Benvenuto's participation in the war events. After spending the first months in Rome as a private at the Battalion of the Railway Engineers, he attended one of the courses for reserve officer cadets (*allievi ufficiali di complemento*) in the engineering and artillery corps, held at the Military Academy of Turin. Assigned to the 22nd Miners Company and destined for Gorizia, he collaborated in the construction of a line of fortifications and developed a variant of the periscope that "obviated the drawback of being able to observe a field that was too low by arranging three mirrors in it instead of two, having an inclination with respect to the horizontal planes that was appropriately greater than 45 degrees." [21] In the spring of 1916, he was transferred to Gemona, where he attended a course in geodesy, but the most significant period dates back to autumn 1917 when, destined for the artillery command of the fifth Army Corps in Schio, he met Mauro Picone. Terracini already knew Picone, albeit only superficially, because he had come to Turin in 1913 as Fubini's assistant at the Polytechnic. In February 1918, both were assigned, together with General Roberto Segre, to the Artillery Command of the Sixth Army in Breganze, and here Picone involved him in the renewal of the firing charts for the use of heavy artillery in the mountains so that the shooting data were assigned according to range and height difference.

The work undertaken led to the publication, edited by Picone, *Tavole di tiro da montagna. Teoria e metodi di compilazione* [Mountain firing charts. Compilation theory and methods]. In the preface, General Segre highlights a specific mathematical contribution by Terracini to the compilation of the charts ([34], p. 5 and p. 43).

Picone was to recall this collaboration on various occasions, also due to the influence it had on his future activity. In the report presented for the mathematical analysis competition at the University of Cagliari, as well as in his speech in 1951 at the IV Congress of the UMI, indeed he recalls that at the time, together with Terracini, he had created a real calculation laboratory, the germ of the future Istituto Nazionale per le Applicazioni del Calcolo [National Institute for Computing Applications]:

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[19] Cf. http://www.corradosegre.unito.it/Quaderni/Quad27/1_27.php, p. 6.

[20] Cf. [58], p. 78: *nettamente favorevole all'intervento dell'Italia in guerra*; on the role of Italian mathematicians in the First World War cf. [31] and [27].

[21] Cf. [58], p. 82: *ovviava all'inconveniente di poter osservare un campo troppo poco alto disponendovi tre specchi anziché due, aventi un'inclinazione rispetto ai piani orizzontali convenientemente maggiore di 45 gradi.*

Fig. 3 M. Picone and A. Terracini in 1917

> In our little office, located in the attic of a country farm, I and the collaborators I had been
> able to obtain worked: Prof. Terracini (Lieutenant of Engineers) ... and later Prof. Signorini
> (Lieutenant of Artillery) ... I had five calculating machines, . . . We worked day and night.[22]
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> Then and for a long time, one of my collaborators—a friend and a genius—was
> ALESSANDRO TERRACINI, ... with whom, in the 6th Army, supported by the comman-
> der of the artillery general ROBERTO SEGRE, we founded a real Calculation Institute.[23]

It is probably due to frequenting Picone that Terracini wrote an article [52]
many years later, aimed at obviating the drawbacks that can occur in practice in
the numerical solution of systems of linear equations with multiple unknowns, when
their number increases. The procedure presented by Terracini is based on the idea of
simultaneously eliminating more unknowns from the system and has the advantage
of being particularly rapid with the use of the calculating machine (Fig. 3).

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[22] Quoted in [30], p. 22: *Nel nostro ufficietto, sito in una soffitta di una fattoria di campagna,
lavoravamo io e i collaboratori che avevo potuto ottenere: il Prof. Terracini (Tenente del
Genio) [. . .] e più tardi il Prof. Signorini (Tenente d'Artiglieria) [. . .]. Ebbi cinque macchine
calcolatrici, [. . .] Il lavoro era diurno e notturno.*

[23] Cf. [35], p. 27: *Fu, allora, a lungo, mio collaboratore—amico e geniale—ALESSANDRO
TERRACINI, [. . .] col quale, alla 6ª Armata, sostenuti dal comandante l'artiglieria generale
ROBERTO SEGRE, fondammo un vero e proprio Istituto di Calcolo.*

4   At the Universities of Modena and Catania

After the war, Terracini returned to Turin, where in 1919 he gave lectures[24] integrating Segre's Higher Geometry course on *Complessi di rette di 1° e 2° grado* [first- and second-degree line complexes], but in the autumn of the same year, Ermenegildo Daniele, Professor of Rational Mechanics in Modena, proposed that he moved to that university where, in addition to continuing to be an assistant, he could be in charge of the course of algebraic analysis.[25] Terracini accepted and immediately entered the university milieu, maintaining relationships with professors of all faculties and, among mathematicians, he frequented Oscar Chisini and Enea Bortolotti, with whom he shared research interests in differential geometry. A favorite meeting point was the Caffè San Carlo or the back shop of the grocery store of Telesforo and Giuditta Fini ([58], pp. 91–92).

The Modena period was productive not only for the contacts he maintained with his colleagues, but also from the point of view of research: indeed, a dozen articles date back to these years, among which Terracini particularly stressed *Sulle superficie le cui asintotiche dei due sistemi sono cubiche sghembe* [On surfaces whose asymptotics of the two systems are twisted cubic curves] ([44], also in [59] I, pp. 130–155):

> Particular examples of surfaces, whose asymptotic lines are twisted cubic (that is the most simple twisted lines, from the algebraical point of view) were still known. I succeeded in a general method for finding the whole class of these surfaces. More generally I found (in finite terms) all the surfaces whose asymptotic lines of both systems belong to linear complexes (a particular case is that of the Tzitzeica-Wilczynski surfaces).[26]

The Modena years were also those that saw the rise of fascism, with all the repression and violence that characterized them. Terracini recalls this period in his autobiography:

> Those were terrible years in which fascism triumphed, also accompanied by violent aspects among which I cannot fail to mention the fire—in central Piazza Mazzini—which destroyed the house of the communist deputy Pio Donati, the brother of Prof. Mario.[27]

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[24] Cfr. QUADERNI. 1 in BMP—*Fondo Terracini*. The lecture note can be accessed at the site http://www.corradosegre.unito.it/fondo_terracini_q.php. In [17].

[25] From 1919–1920 to 1921–1922, he was assistant to the Chair of Descriptive Geometry and in 1922–1923 to the Chair of Algebraic Analysis. From 1919–1920 to 1921–1922, he was in charge of the course of algebraic analysis, and in 1922–1923 of the descriptive geometry course (cf. ACS-Roma, Fondo del Ministero della Pubblica Istruzione, Fascicoli personali dei professori universitari. 3° Versamento Busta 452, AT).

[26] SPSL, *AT*: Terracini, A. Some indications . . . .

[27] Cf. [58], p. 92: *Erano quelli gli anni roventi in cui si affermò il fascismo, accompagnato anche da aspetti violenti tra i quali non posso non rammentare l'incendio—nella centrale piazza Mazzini—con cui fu distrutta la casa del deputato comunista Pio Donati, fratello del prof. Mario.*

Terracini spent a brief period in Turin, during which he married Giulia Sacerdote,[28] who was to give him three children, Lore, Cesare, and Benedetto. Then, having won chairs in both Cagliari and Catania, he chose Catania.

The milieu was stimulating, with a good scientific tradition. In the first decade of the twentieth century, excellent mathematicians had taught in Catania who laid the foundations for a prestigious mathematical institute, Mario Pieri, Giuseppe Lauricella, Guido Fubini, and Michele de Franchis, and from 1919 to 1921, Mauro Picone was the professor in charge of the course of mathematical analysis. Furthermore, in 1921, the Circolo Matematico di Catania was created, directed by Nicolò Spampinato. It published two journals, one, *Note e memorie*, edited by Gaetano Scorza, containing specialized research, and the other, aimed at a wider audience, *Esercitazioni matematiche*, edited by Michele Cipolla.[29] Terracini fit very well into this university too, as shown by the numerous offprints he received in the following years from his Catania friends.[30] Here in 1924–1925, he held the course of analytical geometry and, on a temporary basis, that of higher geometry *Sui fondamenti della geometria differenziale* [On the foundations of differential geometry], and in 1925–1926, he held only two lectures of the higher mathematics course dedicated to *geometria differenziale* [differential geometry].[31] Indeed, at the end of 1925, he was called to Turin to take up the Chair of Analytical Geometry, where he would also teach the higher geometry course until 1937–1938, to resume his post in 1947–1948 after the caesura of the exile.[32] The result of Terracini's teaching in Catania is the *Lezioni di Geometria analitica, Anno Accademico 1924–25* [Lectures in Analytical Geometry, Academic Year 1924–25], lithographed by the *Circolo Matematico* of Catania.

5   Return to Turin: From Tenure to the Racial Laws

Returning to Turin was clearly the greatest of Terracini's aspirations: there his old friends and colleagues had just been joined by Francesco Tricomi, who was already known for his studies on partial differential equations of the second order of mixed type and soon became "a frequent visitor" to his home. Thus, a friendship grew between the two mathematicians, of which Tricomi gave ample proof during the

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[28] The wedding took place in Rome on April 16, 1924 with Eugenio Artom and Enrico Bompiani as witnesses.

[29] On the history of the University of Catania, cf. [40].

[30] The offprints are kept at the Biblioteca speciale di matematica "Giuseppe Peano" of the Department of Mathematics of the University of Turin: see [26].

[31] Cf. [2], p. 97. See also ASUCT: Registri delle lezioni, Facoltà di Scienze fisiche, matematiche e naturali, n. 30: Alessandro Terracini, Registro di Geometria superiore (1924–1925) e Registro di Matematiche superiori (1925–1926).

[32] In ASUT, there are 32 registers of Terracini's lectures from 1936–1937 to 1961–1962.

period of racial persecutions. He recalls the arrival of our geometrician in Turin with these words:

> After Terracini and I came to Turin, the mathematics section of the Faculty of Sciences reached—at least from a numerical point of view—a level never exceeded. Indeed, we mathematicians, including the geodesist and the astronomer, were then 7 out of a total of 15, while today they are not many more out of a total of 35![33]

The Turin mathematicians at the time faced off in two groups, observes Tricomi: "on the one hand, the 'Jewish' or 'rich men' one, which was headed by the illustrious Corrado Segre (1863–1924) who died prematurely the year before, and it was then reduced to Gino Fano (1871–1952) and Guido Fubini (1879–1943) [. . .]; and on the other hand the 'vectorialist' group which, in addition to Giuseppe Peano (1858–1932) [...], included Tommaso Boggio (1877–1963) and the intemperate Cesare Burali-Forti (1861–1931)."[34] The former was more conservative and the latter more progressive. As soon as he arrived in Turin, Tricomi, as he himself recounts, *toto corde* [wholeheartedly] joined the Jewish group, which Terracini also joined.

5.1 Research and Teaching

Before obtaining tenure in 1928, Terracini held two higher geometry courses dedicated to differential geometry and differential geometry of hyperspaces, the research area he favored,[35] and in the same period, he published about ten works. Among the other results, we can mention the unitary definition of the three normals, metric, affine, and projective, of a plane curve, a geometrical interpretation of the projective linear element of a surface in ordinary space introduced by Fubini, simpler than those provided by Čech and by Bompiani. A third result is related to the geometrical meaning of the invariants of a Laplace equation. Terracini's paper on this topic was followed by two notes: the first by Fubini, who from Terracini's interpretation derives a simple geometrical proof of a theorem on *W*-congruences,

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[33] Cf. [63], p. 34: *Con la mia venuta a Torino e del Terracini la sezione matematica della Facoltà di Scienze raggiunse—almeno da punto di vista numerico—un'altezza mai più superata. Invero noi matematici, comprendendo anche il geodeta e l'astronomo, eravamo allora in 7 su un totale di 15, mentre oggi essi non sono molto di più su di un totale di 35!.* For the relationships between Terracini and Tricomi, see the letters in BSMT *Fondo corrispondenza* and *Carte Terracini*. A selection of the letters is present in Milanese, D. Alessandro Terracini (1889–1968) grande organizzatore culturale. Alcune corrispondenze inedite, Dissertation in Mathematics, supervisor L. Giacardi, University of Turin, academic year 1916–1917.

[34] Cf. [63], pp. 32–33: *da un lato quello 'ebraico' o 'dei ricchi', che era stato capeggiato dall'illustre Corrado Segre (1863–1924) prematuramente scomparso l'anno prima, ed era allora ridotto a Gino Fano (1871–1952) e a Guido Fubini (1879–1943) [. . .]; e dall'altro lato il gruppo 'dei vettorialisti' che oltre a Giuseppe Peano (1858–1932) [. . .], comprendeva Tommaso Boggio (1877–1963) e l'intemperante Cesare Burali-Forti (1861–1931).*

[35] Cf. QUADERNI 1, 2, and 3, in BSMT—*Fondo Terracini*. The cahiers can be accessed at the site http://www.corradosegre.unito.it/fondo_terracini_q.php. In [17].

and the second by Bompiani, who provides another geometrical interpretation.[36] In this connection, one of Terracini's favorite lines of research is that which aims to highlight the geometrical aspect of various issues in the simplest way, as Bompiani noted:

> Terracini trained in the geometrical thought of Corrado Segre, feels the value of Fubini's analytical results, but also the need to clarify the geometrical reason.[37]

For example, in the two works published in 1927 on W congruencies ([47, 50], also in [59] I, pp. 188–204), Terracini claims to have tried to construct a new theory of congruencies by combining the advantages of Fubini's theory, which is powerful but lacks geometrical significance, and that of Tzitzeica-Ribaucour, which is geometrically perspicuous but limited:

> Fubini's theory is powerful, but for a great part it lacked any geometrical signification. On the other hand, Tzitzeica-Ribaucour's theory is geometrically perspicuous, but limited in its capacity. I have tried constructing a new theory combining the advantages of both. Besides, some relations between a Laplace equation and its adjoint through integro-differential transformations.[38]

This result is among those reported by Carlo Somigliana in his report for the promotion of Terracini to full professor, a promotion that was approved in the faculty session of January 12, 1928.[39]

Like his master Segre, our mathematician also took great care over teaching and, together with Gino Fano, in 1929 he published the *Lezioni di geometria analitica e proiettiva* [Lectures in analytical and projective geometry] (Turin, Paravia, 1929) republished in a new edition in 1940 after the racial laws were passed. In a letter to Terracini, Fano explains why, despite the vetoes placed on books by Jewish mathematicians, this second edition was published:

> In 1938 the 2nd edition was started, with slight adjustments on stereotype prints In September, as soon as the storm broke out, the company wrote to me, asking if it could definitely destroy all the material! I, of course, replied that there was no hurry—[I asked them] to wait in the meantime; and in one of my trips from Lausanne to Turin, I don't remember if in November 39 or 40, I went to talk about it with Comm. Tancredi, and I pointed out that the prohibition on reprinting only concerned <u>textbooks</u>, which at the University do not exist; and that our volume, <u>a scientific treatise</u>, could therefore be reprinted, provided it suited them. He said he agreed.[40]

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[36] Cf. [45], [46] (also in [59] vol. I, pp. 168–175, and 176–181) and [48]. See also the articles by Fubini [16] and by Bompiani [6].

[37] Cf. [8], p. 12: *Il Terracini, educato al pensiero geometrico di Corrado Segre, sente il valore dei risultati analitici del Fubini, ma anche il bisogno di chiarirne la ragione geometrica.*

[38] SPSL, *AT*: Terracini, A. Some indications … .

[39] ASUT: Scienze MFN, Adunanze 1924–32: *Relazione motivata della Facoltà di Scienze per la promozione a stabile del prof. Alessandro Terracini*, attached to the minutes of the meeting of 12 January 1928.

[40] G. Fano to A. Terracini, New York, 16 December 1947, BSMT *Carte Terracini*: *Nel 1938 fu avviata la 2a edizione, con lievi ritocchi sulle stereotipie. Nel settembre, appena scoppiata la bufera, la Ditta scrisse a me, chiedendo se poteva distruggere senz'altro tutto il materiale! Io,*

Both authors, Fano and Terracini, had already individually published the *Lezioni di Geometria analitica e proiettiva* [Analytical and projective geometry lectures], with the A. Viretto lithographer in Turin, respectively, in 1926–1927 and in 1927–1928, and just in 1927–1928, they had both taught at the Polytechnic of Turin, the former responsible for descriptive geometry with applications and the latter for analytic and projective geometry ([3], pp. 46–47); therefore, their collaboration was greatly facilitated.

The volume had a reprint in 1948 and a third edition in 1957, updated by Terracini, which enjoyed appreciation both in Italy (B. de Finetti, F. Conforto, etc.) and abroad (J. Favard, L. Godeaux, F. Marcus, D. Struik, etc.) for the completeness, clarity, and balance of the various parts.[41] In his review of the 1948 edition, Godeaux also emphasizes that on occasion the authors open up "une fenêtre sur des questions variées" ([20], p. 5). Among other things, indeed, there are hints on vectors and vector calculus, a discussion of the line geometry and, in particular, of the linear line complexes, which lends itself to important applications.

In the summer of 1928, Terracini participated in the International Congress of Mathematicians (Bologna, 3–10 September 1928), presenting a communication in the projective differential geometry section where he introduced the notion of "projective quasi-applicability" [51]. Thanks to Salvatore Pincherle, who at the time held the dual role of president of the Italian Mathematical Union (UMI) and the International Mathematical Union, the Bologna congress represented an important historical moment because it marked the resumption of scientific internationalism compromised by the First World War; at the same time, however, it also showed the first yielding of the Italian mathematical community to fascism, which was to lead to its complete subjection after the racial laws were passed [18, 19].

In the University, as in other areas of society, there was pressure for professors to join the Fascist party and also in Turin the rector Silvio Pivano urged his colleagues to do so. After some time, Terracini confessed that "our behavior, and mine in particular, was not too brilliant, in the sense that we soon followed the pressing invitation; I am ashamed to say it."[42] In August 1931, university professors were required to swear an oath of allegiance to fascism, according to a policy suggested to Mussolini by the geometrician Francesco Severi, inspired by intransigence for unrepentant people like Vito Volterra and by the amnesty to eliminate the "faults" of the ex-anti-fascists such as Severi himself. In all Italy, out of over a thousand university professors, only a dozen refused to take the oath, thus losing their professorships. Among these, the only mathematician was Volterra. Many anti-

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naturalmente, risposi che non vi era fretta—aspettassero, intanto; e in una delle mie gite da Losanna a Torino, non ricordo se nel novembre 39 o nel 40, andai a parlarne con il Comm. Tancredi, e gli feci presente che la proibizione di ristampa concerneva solo i libri di testo, che all'Univ.ª non esistono; e che il nostro volume, trattato scientifico, poteva quindi ristamparsi, sempreché a loro convenisse. Egli si dichiarò d'accordo.

[41] See in particular the letters addressed to Terracini in BSMT: *Carte Terracini, 1947–1948.*

[42] Cf. [58], p. 109: *il nostro, e in particolare il mio, contegno non fu troppo brillante, nel senso che presto seguimmo il pressante invito; Mi vergogno a dirlo.*

fascists also took the oath giving prevalence to concerns over the professional consequences of a refusal, i.e., dismissal, the impossibility of ensuring a future for their alumni, and the fear of leaving the way open to unscrupulous colleagues.[43]

In 1934 and then again in 1941, the statutes of scientific societies were changed, limiting more and more severely the freedom of the world of culture, almost without encountering opposition.

In his scientific autobiography, Terracini makes no particular comments on this political period of progressive "fascistization" of all institutions and all sectors of national activity, from the press to schools, the army, and professional organizations; rather, he dwells on the important research he carried out in those years—about 30 works—and on holidays or trips to the mountains with his friends, Tricomi, Togliatti, Fubini, Beniamino Segre, and Gleb Wataghin, joined in 1930 by Enrico Persico ([58], ch. XIV). Persico had come to Turin to take up the Chair of Theoretical Physics and established a strong friendship with the Terracini family, as evidenced by the beautiful correspondence dating back to the period he spent in Canada at Laval University (Québec) which we will mention below.

However, there are some hints of bitter irony, such as the comment—on the occasion of the promotion to full professor—on the term "*stabile*" (stable) then used to indicate "full professor":

> Actually, the facts did not correspond to the term, because about ten years later there came the so-called racial laws, according to which all Jewish professors, stable or not, were removed from their posts.[44]

Among the works of those years, which partly continue the previous research lines, there is a group of papers that originates from a note of 1921, in which Corrado Segre introduces the concept of approximation order in the incidence of two planes, or of any two spaces that are infinitely close.[45] Terracini was to present a summary exposition of these works several years later in two lectures held, respectively, in Louvain in 1951 and in Marseille in 1956. In this connection, Terracini wrote:

> Many years ago systems of ∞^1 (or more) planes whose two "consecutive" planes always intersect had been considered (s. 6). Having now at my disposal the notion of the order of approximation in which two "consecutive" planes may intersect, the problem has arisen to put in relation the old theory with the new notion. I could give a complete enumeration of the systems of ∞^1 or more planes whose consecutive planes always intersect in an order of approximation greater than usual. Projective applicabilities of a higher order play also a part: isothermal-asymptotic surfaces of S_3 appear from a new point of view.[46]

Terracini faces the problem of connecting the old theory with the new notion in the belief that "in science when, after long research work, a result is finally reached,

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[43] Cf. e.g [29].

[44] Cf. [58], p. 110: *In realtà i fatti corrisposero poco bene al termine, perché una decina di anni dopo vennero le cosiddette leggi razziali, in base alle quali tutti i professori ebrei, stabili o no che fossero, furono rimossi dai loro posti.*

[45] See [53]; [54], also in [59] I, pp. 326–331); and [55].

[46] SPSL, *AT*: Terracini, A. Some indications . . . .

one must not be satisfied with the result in its brute form: it must be checked, criticized, elaborated, considered in a more general framework."[47]

Testifying to his teaching activity in this period, there remain 13 notebooks relating to the higher geometry courses[48] and 5 registers,[49] which show that Terracini, like his mentor Segre, in addition to noting his lessons in small booklets, changed the subject of the course almost every year and attached importance to the historical aspects of his discipline. In particular, he devoted the course of 1934–1935 to Segre's geometrical work and its developments.

5.2 *"Amputation" of the Italian Scientific Community and the Decision to Emigrate*

At the time, the Fascist regime had easily taken over most of the vital sectors of the nation, including that of the community of mathematicians. In 1936, the government had not granted authorization to participate in the International Congress of Mathematicians in Oslo because Norway, following the directives of the League of Nations, had sanctioned Italy for the attack on Ethiopia. Severi himself, although the regime was favorable to him, was unable to participate although he had been invited to hold a plenary lecture and was president of the international commission charged with studying international cooperation of mathematicians. Terracini was also denied authorization.[50]

The following year, he did not participate in the first Congress of the UMI (Florence, 1–3 April 1937), although he had been a member of the Union since its foundation in 1922; instead, his friend Bompiani, at the time a member of the Scientific Commission of the UMI, held a general lecture on modern addresses in differential projective geometry. The congress was characterized by opportunistic behavior towards the regime, both in the exaggeratedly celebratory tones of the inaugural speeches and in the decision to give ample space to applied mathematics, the only ones that could interest the government [4].

However, it was only in 1938, when the anti-Jewish campaign began, that Terracini seem to have realized the seriousness of the situation. On July 14, the manifesto of racist scientists, *Il Fascismo e i problemi della razza* [Fascism and the problems of race], appeared in *Il Giornale d'Italia* and was republished on August 5 by the magazine *La difesa della razza*. After that, there was a rapid crescendo that

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[47] Cf. [57], p. 75: *nella scienza quando, dopo un lungo lavoro di ricerca, si giunge infine ad un risultato, non bisogna accontentarsi del risultato nella sua forma bruta: bisogna controllarlo, criticarlo, elaborarlo, considerarlo in un quadro più generale*.

[48] Cf. http://www.corradosegre.unito.it/fondo_terracini_q.php. In [17].

[49] ASUT: *Scienze MFN*, Alessandro Terracini, *Registri delle lezioni* from 1936–1937 to 1961–1962.

[50] ASUT: Alessandro Terracini, Fascicolo personale, A. Terracini to S. Pivano (rector of the University of Turin), 17 April 1936, and C. De Vecchi di Val Cismon (Minister of National Education) to S. Pivano, 30 May 1936.

led on 22nd of the same month to the census of the Jews present in the Kingdom of Italy, a survey of an "eminently political character,"[51] which provided the regime with the most effective tool for identifying those to be targeted. Terracini recalls that period with bitter words:

> The daily campaign which tended to isolate the Jews from the core of the remaining Italian population and to hold them up to public contempt and hatred, was extremely upsetting. In the second half of August the news arrived from friends, who were vacationing in Cogne at that time, that the order to take a census of Jews had already arrived there. Then came the shame of so-called discrimination—which brought with it the shameful example of some Jews who, wishing in some way to further their aspiration to change their too obviously Jewish surnames to take on "Aryan" ones, did not hesitate to declare publicly that their mothers, who in reality had never done their husbands the slightest wrong, had deceived them with "Aryans" shortly before their birth.[52]

In the autumn of the same year, the so-called racial laws were enacted, with very serious consequences for the Jewish community, which was eliminated from all the vital ganglia of the nation.

In the newspaper *Critica fascista* on September 15, 1938, we read these chilling words:

> In school, man's personality is formed, so the purge had to begin in school. If we want one hundred percent Italians, we must make them such; therefore, we must have a school that is one hundred percent Italian, and therefore such in the teachings, in the books and in the pupils. [. . .] Italian science was in danger of being greatly compromised by this tenacious parasitic vegetation; from today our universities are suddenly freed. [53]

Italian universities were dramatically affected. The "amputation"[54] of the national scientific community was made possible by the previous mass census operation, and it should be noted that there were no real forms of resistance in

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[51] Cf. [39], p. 62: "carattere eminentemente politico."

[52] Cf. [58], p. 119–120. *La quotidiana campagna, che tendeva a isolare gli ebrei dal nucleo della rimanente popolazione italiana e ad additarli al pubblico disprezzo e odio, riusciva estremamente molesta. Nella seconda metà di agosto giunse da amici, che in quel periodo villeggiavano a Cogne, la notizia che là era già arrivato l'ordine di censire gli ebrei. Poi giunse l'onta delle cosiddette discriminazioni—che portarono con sé il vergognoso esempio di qualche ebreo, che, desiderando suffragare in qualche modo la sua aspirazione a cambiare il proprio cognome troppo manifestamente ebraico per assumerne uno «ariano», non esitò a dichiarare pubblicamente che la propria madre, la quale in realtà non aveva mai fatto il minimo torto al marito, poco prima della sua nascita lo aveva invece ingannato con un 'ariano'.*

[53] Cf. [14], p. 339: *Nella scuola si forma la personalità dell'uomo, perciò nella scuola si doveva cominciare l'epurazione. Se vogliamo italiani al cento per cento, dobbiamo formarli tali; dunque dobbiamo avere una scuola che sia italiana al cento per cento; quindi tale negli insegnamenti, nei libri e negli scolari. [. . .] La scienza italiana rischiava di essere molto compromessa da questa tenace vegetazione parassitaria, da oggi le nostre Università vengono di colpo liberate.*

[54] *Ivi.*

university and academic institutions, except for isolated cases such as that of Benedetto Croce.[55]

The Italian Mathematical Union itself proved to be completely subservient to the regime. All solidarity was denied to the teachers and colleagues affected by the shameful measures, and indeed people took advantage of their exclusion from the scientific and academic community. It is worth recalling once again the unspeakable statements made during the session of the scientific commission on December 10, 1938:

> The Italian school of mathematics, which has acquired vast renown throughout the scientific world, is almost entirely the creation of scientists of the Italic (Aryan) race [. . .]. Even after the elimination of some scholars of the Jewish race, it has retained scientists who, in number and quality, are enough to maintain the tone of Italian mathematical science at a very high level, and teachers who with their intense work of scientific proselytism ensure the Nation people worthy of holding all the necessary professorships.[56]

Many years later, making a comparison with what happened in Argentina in the summer of 1943, Terracini wrote:

> However, I believe it is worth noting that the opposition to the dictatorship in Argentina, and especially in its universities, was greater when compared with Italian resistance to fascism.[57]

In Turin, the expulsion of Jewish mathematicians from the Faculty of Sciences—in addition to Terracini, also Gino Fano, Guido Fubini, and Bonaparte Colombo[58]—created a real emergency because the chairs of higher geometry, descriptive geometry, and higher analysis and the post of complementary mathematics were left uncovered, as Tricomi pointed out:

> In any case, then things went somehow forward until 1938, when, with the mad expulsion of the Jews from teaching, our universities received a terrible blow . . . In particular, here in Turin, the responsibility of the entire mathematics section of our Faculty fell practically on the shoulders of BOGGIO and the undersigned, who, while multiplying their efforts, could only slow down the now unstoppable decline.[59]

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[55] The subject has been studied extensively and has recently given rise to further research on the occasion of the 80th anniversary of the promulgation of the infamous laws. We will only mention [9, 10, 21–23, 29].

[56] Bollettino della Unione Matematica Italiana, (2) 1, 89 (1939): *La scuola matematica italiana, che ha acquistato vasta rinomanza in tutto il mondo scientifico, è quasi totalmente creazione di scienziati di razza italica (ariana) [. . .]. Essa, anche dopo le eliminazioni di alcuni cultori di razza ebraica, ha conservato scienziati che, per numero e per qualità, bastano a mantenere elevatissimo, di fronte all'estero, il tono della scienza matematica italiana, e maestri che con la loro intensa opera di proselitismo scientifico assicurano alla Nazione elementi degni di ricoprire tutte le cattedre necessarie.* On this cf. e.g. [18], § 2.

[57] Cf. [58], p. 133. *Credo tuttavia degno di essere rilevato il fatto che le opposizioni alla dittatura manifestatesi in Argentina, e soprattutto nelle sue università, furono maggiori se confrontate con le resistenze italiane al fascismo.*

[58] Cf. [38] and in particular the documents in the Appendix; see also [24].

[59] Cf. [63], p. 36: A*d ogni modo allora le cose andarono in qualche modo avanti sino al 1938 anno in cui, con la folle cacciata degli ebrei dall'insegnamento, le nostre università ricevettero un*

The historical archive of the University of Turin preserves extensive documentation on the census of "Personnel of Jewish race," [60] including the forms that all personnel were required to fill out, and on the effects of racial laws. The efficiency with which the offices proceeded with the analysis of the data included in the cards in order to apply these laws is sadly impressive (Figs. 4 and 5).

On 3 September 1938, Alessandro wrote to his family:

> So here it happened … and much more than expected! You just have to absorb the blow by trying not to get too upset, and thinking about what will be necessary.[61]

His friends Tricomi, Persico, and Buzano did not abandon him, and neither did Picone, who was also openly fascist. Tricomi, in his obituary, which is anything but benevolent, acknowledges that:

> [Picone] was almost childishly vain, which even led him to strut around in the lugubrious Fascist uniform, without realizing what and how many iniquities it was a symbol of! However, when it came to more serious things than a fez or *orbace* jacket with glowing badges, he showed more dignity than some vociferous ex-anti-fascists and after the tragedy of the Jews in 1938, he courageously offered a place in his Institute to Alessandro Terracini.[62]

However, Terracini, after a few months of "voluntary isolation,"[63] made the decision to emigrate in order to regain the freedom and civil, academic, and human dignity of which he had been deprived.

Thus began a new phase in his life that was to prove fruitful from various points of view.[64]

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colpo terribile […]. In ispecie, qui a Torino, la responsabilità dell'intera sezione matematica della nostra Facoltà ricadde praticamente sulle spalle di BOGGIO e di chi vi parla che, pur moltiplicando gli sforzi, non poterono far altro che rallentare l'ormai inarrestabile decadenza.

[60] Cf. the documents in ASUT: Corrispondenza—Carteggio 1938 2.1—Professori ordinari; Carteggio 1938 2.1—Professori incaricati—Pratiche generali; Carteggio 1938 2.1—Professori incaricati. Schede personali.

[61] Quoted in [60], p. 444: *Ecco dunque avvenuto […] e assai più di quello che si aspettava! Non c'è che da incassare il colpo prendendosela il meno che si può, e pensare a quanto sarà necessario.*

[62] Cf. [64], p. 575: *[Picone] era di una quasi puerile vanità, che lo portò perfino a pavoneggiarsi nella lugubre uniforme fascista, senza rendersi codnto di quali e quante iniquità essa era simbolo! Però, quando si trattò di cose più serie di un fez o di una giacca d'orbace con rutilanti placche, mostrò più dignità di qualche vociferoso ex-antifascista e dopo la tragedia degli Ebrei nel 1938, offri coraggiosamente un posto nel suo Istituto ad Alessandro Terracini.*

[63] Cf. [58], p. 121: *volontario isolamento*.

[64] On Terracini's exile in Argentina, see [25].

Fig. 4 ASUT, personal form of Alessandro Terracini

Fig. 5 Notice of suspension from teaching

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