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FROM EMANCIPATION TO PERSECUTION: ASPECTS AND MOMENTS OF THE JEWISH MATHEMATICAL MILIEU IN TURIN (1848-1938)

Abstract: In the 1840s, the Jewish community in Piedmont was given full civil and political rights, including the right to education for both men and women. This gave the start to a process of assimilation that led to the construction of large, well-educated and productive community in Turin of mathematicians that included such important figures as Corrado Segre, Beppo Levi and Alessandro Terracini. The enactment by the Fascist Regime of the racial laws in 1938 shattered that community, causing many who had never thought of themselves as anything of

themselves as anything but Italian to forge new lives and new ties. The expulsion of Jews from academic and institutional positions led to a re-mobilisation of resources. This paper traces the formation and assimilation of Jewish scientists from 1848 through the enactment of the racial laws, attempts to identify shared traits that characterize them as a community, and examines the consequences of those laws from 1938 until their repeal in 1944.

Introduction

In the early 1930s a Fascist who described himself as an «old Blackshirt, anonymous for obvious reasons», denounced:

In the University of Turin, School of Mathematics, a few Jewish teachers, Freemason-socialists headed by the all-powerful Prof. Fubini, with a skill and Jesuitism of the worst kind, resort to every measure possible to demolish what the Regime, with titanic efforts, is building. Further, said Faculty is home to tyranny of all types: favoured are the protected ones, the disciples who must one day continue the infamous work, destroyer of the homeland, whilst those who they know they cannot draw into their circle are oppressed, boycotted and damaged in countless ways.¹

1 Archivio Centrale dello Stato Roma, Ministero della Pubblica Istruzione. Fascicoli personali. Professori ordinari(1940-70) 3° versamento. Busta 214, *Personal dossier of Guido Fubini*, 7 October

As a rebuttal to such a statement we might cite what Giorgio Israel wrote (2010, p. 298) about the circle of Italian Jewish mathematicians who gathered in Rome around Vito Volterra: «such an entity never existed, except in the minds of the advocates of Fascist anti-Semitism». However, the boorish and calumnious tones of the report aside, it is true that in those years the presence of Jewish scholars was outstanding at the University of Turin, the Department of Mathematics counting three Jewish full professors out of nine: Gino Fano (1871-1952), Guido Fubini (1879-1943) and Alessandro Terracini (1889-1968), in addition to two young associate professors and tenured lecturers: Bonaparte Colombo (1902-1989) and Beniamino Segre (1903-1977).

Such numerical relevance was the achievement of a long process begun even before the Risorgimento, a process that, besides determining a high level of schooling among the Jewish population in Piedmont, had been one of the main elements of their emancipation and social progress.

The enactment of the racial laws in 1938 represented the abrupt interruption of that path. The application of the laws had dramatic consequences for both the University of Turin (numerically the one most affected, after Bologna and Milan) and the local scientific community, which changed irreversibly.

Our aim in what follows is threefold. First of all we will describe the socio-cultural premises that led to the development of such a large and appreciated community of Jewish men and women of science in Piedmont, from the Risorgimento period through the Belle Epoque and up to the last phase of the Fascist dictatorship. Secondly, we will try to identify their common traits (obviously not the ‘racial’ identity, artificially constructed by institutionalised anti-Semitism, but shared tendencies and stances that allow us to in some way identify a scholarly group). Finally, we aim to illustrate the disruptive effects that their expulsion had on the Turinese cultural milieu.

1933: «Nella R. Università di Torino, Scuola di Matematica, pochi professori ebrei, social-massoni capeggiati dall’onnipotente prof. Fubini, con un’arte ed un gesuitismo della peggior specie si adoperano con ogni mezzo, per demolire quanto il Regime, con titaniche imprese, sta costruendo. In detta Facoltà si verificano inoltre soprusi di ogni risma: sono favoriti i protetti, i discepoli che dovranno un giorno continuare la opera infame, disfatrice della Patria, e sono oppressi, boicottati, danneggiati in ogni modo quelli che essi fanno di non potere attirare nella loro cerchia... Vecchia Camicia Nera, anonima suo malgrado per evidente necessità».

2. From Ghettos to Integration

2.1. *Emancipation*

In order to correctly situate our analysis we should bear in mind that at the beginning of the twentieth century Turin was home to the fourth largest Jewish community in Italy after Rome, Milan and Trieste: 4,060 Jews, 0.5% of the urban population. The reasons for this concentration are related to the history of the Jewish diaspora (Renata Segre 1986-90). In Piedmont the main settlements began in the fifteenth century and consisted of Jews who escaped from Provence, attracted by the prospect of moderately good living conditions. Through the sixteenth, seventeenth and eighteenth centuries, many important communities (then called *università*, universities) formed in Turin, the largest city in Piedmont, as well as in the smaller villages of Asti, Alessandria, Carmagnola, Casale Monferrato, Cuneo, Fossano, Moncalvo, Saluzzo and Savigliano. Jews lived together in specific areas (ghettos), and suffered numerous deprivations, included the prohibition against entering schools and belonging to art and trade guilds. At the beginning of the nineteenth century, motivated by the conviction that 'an age that censures life sentences cannot approve of ghettos',¹ Camillo Benso, Count of Cavour and many intellectuals, including the brothers Massimo and Roberto d'Azeglio, Vittorio Alfieri and Vincenzo Gioberti just quoted, pleaded for the extension of the rights of freedom and equality to oppressed minorities in the Kingdom of Sardinia. Eventually, King Carlo Alberto made a Parliamentary decision (*Statuto Albertino*) in March 1848 permitting the extension of all civil and political rights to Waldensians (17 Feb 1848) and Jews (29 Mar and 19 Jun 1848). The gratitude of the Piedmont communities for emancipation was prompt and explicit. It became a leitmotif of nineteenth-century rabbinic rhetoric and it translated into several attitudes of «devotion to the new Italy of Risorgimento» and to many charitable donations to the poor, the children and the philanthropic institutions of every faith.²

2.2. *Between Emancipation and Assimilation*

As a result of this emancipation, Jews began a new life: they could practice any profession or commercial activity and could participate actively

1 Gioberti (1848), p. 44: «Un secolo che biasima gli ergastoli non può approvare i ghetti».

2 See for example the reports appeared in local newspapers: «La Gazzetta piemontese», 25 Nov 1878, 17 Jun 1885, 7 Apr 1889, 14 Jul 1889, 31 May 1892 and «La Stampa», 18 Feb 1896, 22 Nov 1898, 4 Feb 1900, 21 Aug 1900, 29 May 1915, 7 Nov 1927, 8 Nov 1927, 5 Nov 1930, 5 Nov 1932.

in political life, which they did with great determination and success. It was thus inevitable that outlying Jewish communities would grow smaller while that of Turin grew. After a few years, the families of many prospective mathematicians whom we will mention in what follows, like Corrado and Beniamino Segre, Beppo and Eugenio Elia Levi, Ida and Alessandro Terracini, left their hometown communities (respectively Saluzzo, Ivrea and Asti) and moved to Turin. In this new context, the young generations grew up in families that were increasingly secular and emancipated, in which 'religion blended with the cult of the State' (Morpurgo 2016). For example, Emilio Artom (1888-1952), a disciple of Corrado Segre and Federico Enriques, and later a renowned teacher of mathematics in Aosta and Turin, recalled:

Both my father and mother had such a strong sense of Italian patriotism, adhering totally to liberal-monarchic ideals. My father's devotion to the House of Savoy was limitless. My mother followed the same way of thinking and connected it to religion. I'll never forget how she taught us that whoever sacrificed their life for their country would go to Heaven, according to the teaching of the Second Book of the Maccabees.¹

Thus, in the years 1848-1938 an important Jewish community formed in Turin, a community very multifaceted and transversal from both the social and political points of view. It comprised monarchists as well as anarchists, socialists as well as fervent Fascists, such as the group of intellectuals led by the economist Ettore Ovazza (1892-1943) that in 1934 founded the periodical *La nostra bandiera*, aimed at illustrating the extent to which the Italian Judaism co-operated with the Regime in academic, military and political initiatives (Ventura 2002).

A really distinctive element of Turinese Jewry was represented by their professional and occupational profiles: a large number of these men and women worked in the cultural environment as lecturers and full professors at university; as teachers, headmasters and inspectors in all types and order of schools; in the publishing industry (as journalists, collaborators and publishers within famous houses such as Lattes and Rosenberg Sellier); in philanthropic and charitable institutions in support of education and instruction (boarding schools, orphanages, children camps and centres, etc.).

¹ Emilio Artom, *Dalle memorie autobiografiche (1940-41)*, in Treves (1954), p. 50: «Tanto il babbo quanto la mamma erano dotati di un forte senso di italianità, e aderivano alle idealità monarchico-liberali. La devozione di mio padre verso Casa Savoia era illimitata. La mamma seguiva sentimentalmente le stesse correnti, e le collegava con la religione. Non dimenticherò mai che ella ci insegnava che, chi muore combattendo per la Patria, va in paradiso, secondo l'insegnamento del secondo libro dei Maccabei».

The reasons for this had their roots in the Risorgimento period. As we have previously mentioned, King Carlo Alberto had granted Jews full civil rights, and in particular the possibility of enrolling in State institutions. This was a concession of maximum importance, since exclusion from education had represented one of the most sinister forms of discrimination. Furthermore, in the eyes of the Savoy leadership, access to study was a key tool in the process of integration. As the pedagogue Domenico Berti affirmed, explaining this political strategy: «educating is synonymous with emancipating, and emancipating is synonymous with educating».1

However, even before the promulgation of the Albertine Statute, Piedmont Jews who were determined to pursue their studies had two alternatives: emigrate to states like the Grand Duchy of Tuscany, the Kingdom of Lombardy-Venetia, Prussia and France, where less restrictive norms were in force, or attend the Jewish schools.

2.3. *Transferring for Education*

Among the first Piedmont Israelites who left Piedmont in order to undertake studies in mathematics Simeone Levi (1843-1913) stands out. Born in Carmagnola, Simeone received his first education at home, where his father taught him to read and count when he was three years old. Immediately after emancipation, in 1849, he enrolled him in public school, where his unusual talent distinguished Simeone, to the point that he was rightly admitted to the Real Collegio delle Province Carlo Alberto in Moncalieri (Arian Levi & Viterbo 1999). In 1861, having obtained a diploma at the Gioberti lyceum in Turin, Levi enrolled in the program of mathematics at the University of Turin, thanks to a scholarship assigned to him by Baron Raimondo Franchetti (1829-1905), husband of Sara Louise Rothschild (1834-1924), and with the help of Donato Levi (1834-1885), professor of projective and descriptive geometry, who gave him private tutoring in view of the admission exams. Because the degree course in pure mathematics failed to start, in 1864 Levi was forced to move to Pisa, where he came into contact with Enrico Betti, who he considered his *Maestro* for the rest of his life (Simeone Levi 2001). After completing his degree with full marks, Levi returned to Piedmont and started

1 Berti (1849-1850), p. 724: «Educare è sinonimo di emancipare, ed emancipare è sinonimo di educare».

to teach at the technical and accounting school in Tortona, publishing the handbook *Complementi di aritmetica ed algebra* (Turin, Paravia, 1871).¹ For some years, Simeone also toyed with the ambition of pursuing a university career, for which he published some research works and took the exam for obtaining the position of *dottore aggregato*. Embittered by the failure, due to the opposition of some colleagues, and particularly of the physicist Bartolomeo Erba, Levi interrupted his scientific work in 1876.

2.4. *Instruction in the Jewish Schools*

The Jews who had not the chance or chose not to emigrate could rely on the educational network inside the ghettos. Despite the precariousness of segregated life, the Jewish school – the traditional Talmud Torah school reorganised and became a place of both religious and secular training – constituted one of the hinges on which the communities revolved, to the point that some scholars postulated a «continuity between traditional rabbinic education and modern humanistic and scientific training ... in those contexts where there were the greatest freedom and well-being».² As far as our case is concerned, according to the memorandum of Luigi Vigna and Vincenzo Aliberti (1848) the Jewish educational web in the Kingdom of Sardinia consisted of four main institutes in the towns of Turin, Asti, Casale and Acqui. To these one should add a large group of small schools, established in various villages of Piedmont: Cuneo, Fossano, Mondovì, Saluzzo, Casale, Alessandria, Nizza Monferrato, Biella, Ivrea, Chieri, Savigliano, Carmagnola, Cherasco (see Giribaldi Sardi 1993; Maida 2001 and the relevant references therein). In Turin, the Collegio Israelitico Colonna e Finzi, founded in 1823, consisted of a kindergarten and a primary school. Children of both sexes were admitted, free if they came from poor families. The teaching of math there was reduced to the first four rules of arithmetic and to basic notions of plane and solid

¹ This text appears very modern in comparison to the better-known books of the time, and includes contents such as a generalisation of Newton's formula of the binomium according to Betti, linear systems, continuous fractions, numerical and approximate calculus, the theory of numbers and the first concepts of probability. Equally unusual for the times is the insertion of sections on non-decimal numerical systems and on financial mathematics, as well as the particular style of exposition, which is dialogic and even ironic at some points. The originality of Levi's textbook emerges even more clearly if we consider that many of the topics dealt with had made their first appearance only a few years earlier, in 1867, in Angelo Genocchi's lectures on calculus at the University of Turin (Luciano 2013a). Two very positive reviews of Levi's textbook appeared on the local newspaper «La Gazzetta Piemontese», 3 Oct 1871, p. 1 and 3 Dec 1871, p. 1.

² Momigliano (1987), pp. 134-135: «Continuità tra la tradizionale educazione rabbinica e la moderna formazione umanistica e scientifica ... in quei luoghi in cui maggiori erano libertà e benessere».

geometry. However, bearing in mind the occupational prospects of the majority of the students, who would become surveyors, accountants and primary school teachers, in the fifth grade some notions of accounting and single- and double-entry bookkeeping were usually introduced (Luciano 2013a).

Further, a wide and ramified network of Jewish professional and technical schools blossomed in Piedmont, arriving to boast seventeen institutes born thanks to private charity, which often opened their doors to Catholic students also. In this connection, we limit ourselves to mentioning the first private school for crafts and trades, opened in April 1858 by Moise d'Isaac; the female Italian-Jewish boarding school, which was active in 1855; the Istituto Foà for manual work (1901); the professional school for workers and farmers, created in 1911, and the technical institute that Elia Samuel Artom (1887-1965) directed in the years 1912-1920, taking as model the rabbinic high schools in Livorno.¹ Within these institutes, the teaching assigned a major role to applied mathematics, chemistry and technology. In effect, these competences were considered essential for giving a truly modern culture to new generations, so as to allow them to excel in Piedmont society. However, the professional and practical character of the instruction offered had as a consequence that few of their former students pursued studies at university in the courses of pure mathematics and physics.

Jewish schools enjoyed such a good reputation during the Risorgimento period that the methods, structures, and educational models adopted there drew the interest of politicians and intellectuals, and even of pedagogues such as Domenico Berti, Ferrante Aporti, Luigi Franchi and Pietro Baricco.² Their student population was really quite numerous, if one considers that in a small town like Cuneo,

... at the beginning of 1858, two schools were set up, one for male and the other for female pupils, where, in addition to Jewish and religious studies, the complete

¹ Documentation on these schools is very difficult to find. Some data can be deduced from Consiglio Superiore di Pubblica Istruzione, *Seduta del 25 aprile 1858*, pp. 346-350, 359-363; *Seduta del 29 aprile 1858*, pp. 387-404 (*Moise d'Isaac Maestro: Domanda di aprire un Collegio-Convitto Commerciale in Torino*); «L'Educatore Israelita», 3, 1855, pp. 365-366; «La Stampa», 22 Aug 1901 and (Elia Samuel Artom 1913).

² For example Massimo D'Azeglio praised the «educational charity» («carità educatrice») and the flourishing schools created by the Jews in the Pre-Unity Italian States, and especially in the Kingdom of Sardinia, despite considerable obstacles and restrictions (Atti del Parlamento Subalpino, *Sessione del 1848*, Torino 1855, pp. 32-33). N. Tommaseo, on the other hand, emphasised the role of women in Jewish education (*Diritti degli Israeliti alla civile uguaglianza*, «L'Istituto», VII, 1859, pp. 484-488).

primary curriculum of four classes was organised, along with a kinder-garten. These schools are attended yearly by an average of 70 pupils. Now, if we take into consideration that no fewer than fifteen students, graduated from these institutes, are now attending the gymnasium and the technical schools, we will count a group of 85 children oriented towards education and instruction, out of total Jewish population of 310 individuals: and that's rare, if not unique, in a school statistic. Surely, the Israelis of Cuneo could no better respond to the voice calling them to participate in Italian redemption, nor show themselves more worthy of today's progressive civilisation.¹

After Italian unification, however, this system fell into a sharp decline and many of its centres were reduced to being schools *of* and *for* the poor. Down to just four by the end of the 1920s, very few students attended these institutes and they often came from the most observant or needy families, tempted by the fact that pupils were offered free room, board, books and materials. In particular, this educational network was damaged by the change in mentality that affected much of the emancipated Jewry in Piedmont, and above all by the belief that equality of rights began with equality of cultural opportunities (Elia Samuel Artom 1913; Colombo 1925). As the periodicals *Vessillo Israelitico* and *L'Educatore Israelita* denounced, in connection with the Collegio Israelitico Colonna e Finzi in Turin:

Few young people attend it, and very few profit by it. Fathers have a burning desire for their children to jump rapidly from one class after another to get to the university and there hurriedly take a degree, ... so the new generations ... will be neither Catholic nor Jewish, but instead atheist.²

Jewish magazines tried (without success) to stem this process, for example by reporting on the student performances and career successes achieved by Corrado Segre, Costantina Levi (1870-?), Ida Terracini (1870-

1 Giuseppe Emanuel Levi (1864), p. 27: «... in sullo scorcio del 1858 vennero istituite due scuole, di cui l'una maschile e l'altra femminile, – ove, oltre agli studi ebraici e religiosi, si fa il corso elementare di tutte le quattro classi, – e un asilo infantile. Queste scuole sono frequentate annualmente da una media di 70 alunni. Ora se si calcola che ben quindici alunni da quelle usciti frequentano in questo momento gli uni le scuole ginnasiali, gli altri le scuole tecniche, si avrà un complesso di 85 fanciulli dati all'educazione ed istruzione, sopra una popolazione israelitica di 310 individui: cosa rara se non unica in una statistica scolastica. Non potevano certo gli Israeliti Cuneesi meglio rispondere a quella voce che li chiamava a partecipare all'Italiana redenzione, né più degni mostrarsi della progredita civiltà odierna».

2 «Vessillo Israelitico», III, 1855, pp. 365-366 and «L'Educatore Israelita», XVIII, 1868, p. 307: «Pochi giovani lo frequentano, pochissimi ne ritraggono frutti, insomma v'ha fortemente a temere che fra non molto non vi saranno più giovani che capiscano le nostre orazioni. I padri hanno vivo desiderio che i figli loro saltino a piè pari classi su classi sino ad arrivare all'università e quivi prendere in tutta furia una laurea, ... così la nuova generazione ... verrà a crescere né israelita, né cattolica, ma atea».

1964), Beppo Levi (1875-1961), and by the scholars who arrived at the University of Turin from other places, such as Vito Volterra (1860-1940), Gino Loria (1862-1954), Guido Castelnuovo (1865-1952), Azeglio Bemporad (1875-1945), and others:

Saluzzo. Prof. Corrado Segre, who teaches at the University of Turin, is without exaggeration a genius for mathematics. Although young, he has already had a wonderful career. He is the son of the well-known industrialist of this city ..., the lamented Abram Segre, who renovated the S. Martino silk factory, now managed by the company Mana & Demartini. Professor Segre, though young, made extremely rapid progress and is already reputed to be, without adulation, an illustration of science.¹

Turin. Here is a true triumph that we congratulate. On 30 June, in our University Miss Constantina Levi graduated with full marks in pure mathematics. The illustrious professor D'Ovidio, head of the faculty, announcing to the young doctor the diploma earned, wished to address to her sincere words of praise for the way in which she developed the difficult research topic entitled: 'Preliminary results in the theory of algebraic forms with series of multiple variables'²

The good level of education given to young Jews starting in the Risorgimento period, and the fact that such educational opportunities were also guaranteed to girls, meant that by the second half of nineteenth century they began to come out on top in the public institutes. In Turin, at the d'Azeglio, Alfieri and Gioberti lyceums and at the Sommeiller technical institute, the first enrolments date from the 1850s (D'Orsi 2003, pp. 175-197; Liceo Gioberti *et alii* 2012, pp. 113-116). The first licenses to teach math and science in technical institutes and normal schools were awarded in 1868 to Isacco Jona, Giacomo Debenedetti and Israel Moise Pavia.

In actual fact, however, the majority of these young Jews who dedicated themselves to scientific studies completed only the first two years

¹ «Il Vessillo israelitico», XLII, 1894, pp. 36-37: «Saluzzo. Il Prof. Corrado Segre che insegna all'Università di Torino è senza esagerazione un genio per la matematica. Quantunque giovane ancora egli ha già percorso una splendida carriera. Egli è figlio del noto industriale di questa città ..., del compianto Segre Abram, che ridusse alla moderna il setificio di S. Martino ora esercitato dalla Ditta Mana e Demartini. Il prof. Segre, quantunque giovane, fece dei progressi rapidissimi ed è già reputato, senza adulazione, un'illustrazione della scienza».

² «Il Vessillo israelitico», XLI, 1893, p. 252: «Torino. Ecco un vero trionfo di cui ci congratuliamo. Il 30 giugno alla nostra Università si addottorava in matematiche pure la signorina Costantina Levi riportando i pieni voti legali. L'illustre prof. D'Ovidio, preside della Facoltà, annunciando alla giovane dottoressa il diploma confortevole, volle rivolgerle sentite parole di elogio nel modo con cui aveva svolto il difficile tema intitolato: Preliminari della teoria delle forme algebriche con più serie di variabili ...». In addition to the two quotations cited here, see «Il Vessillo Israelitico», XL, 1892, p. 265; XLII, 1894, pp. 36-37; XLIII, 1895, p. 242; XLIV, 1896, pp. 208, 244, 279; XLVII, 1899, pp. 109-110, 155; XLVIII, 1900, p. 160.

of the university programs in order to obtain the license (*licenza*) and subsequently went to the *scuola di applicazione*, aspiring to careers as architects or engineers.¹ What oriented their choices was a complex mix of family and economic factors, as well as cultural models. The testimonies of many mathematicians born in the 1860s confirm the impression that the so-called *humanitas scientifica* was a category of thought that was almost foreign to Jewish families, which considered scientific training above all in relation to the occupational prospects that it opened. Corrado Segre, Gino Fano, and many others had to face serious generational clashes with their fathers, who pushed them to studies in engineering or industry, while they themselves were inclined towards pure research undertaken «out of love for knowledge» (Beniamino Segre 1963, p. 9; Gino Fano 1925, p. 219).

This situation changed after 1880. During the Belle Epoque, the number of Israelites who took up advanced scientific studies continued to be remarkable: 105 out of 1957 students who graduated in the years 1880-1938 were of Jewish identity. In contrast with the past, instead, forty-two graduated in pure mathematics (representing 24% of the total number of degrees).² Among them, Corrado Segre, Gino Loria, Gino Fano, Beppo Levi, Alessandro Terracini and Beniamino Segre became full professors (*professori ordinari*) of various mathematical disciplines; Giorgio Lattes, Alberto Levi (1874-1970), Bonaparte Colombo and Elda Valabrega (1924-1993) entered the academic staff as tenured lecturers (*assistenti, liberi docenti*) and associate professors (*professori aggregati* or *incaricati*). A further sixteen became teachers or headmasters in state middle and secondary schools.

1 ASUT, *Esami di architetto, ingegnere civile e idraulico, misuratore, agrimensore e maestro de' con-ti*, XD 15, 1847-50, pp. 241, 309; XD 16, 1850-52, pp. 50, 241; XD 17, 1852-53, pp. 49, 96, 125, 165, 167, 233, 261; XD 18, 1853-56, pp. 5, 21, 59, 72, 153, 171, 208, 237, 264, 276, 296; XD 19, 1856-58, pp. 50, 65, 67, 166, 180, 203, 207, 243, 261, 290; XD 20, 1858-60, pp. 16, 55, 73, 76, 110, 118, 175, 182, 209, 211, 244, 267, 269, 273; XD 21, 1860-61, pp. 48, 68, 79, 91, 94, 142, 149; XD 22, 1862-63, pp. 43, 51, 60, 94, 107, 109, 131, 167, 169, 172, 203, 204, 222, 224, 230, 256, 259, 271, 275, 276, 286, 322, 324, 377, 381, 395, 399, 400, 422, 430, 433; *Esami di laurea. Esami generali scritti e orali di scienze fisico matematiche per il conferimento del grado di dottore*, XD 188, 1864-75, pp. 37, 38, 146, 147; XD 190, 1877-80, p. 22; X.L. *Rubriche dei Laureati e Licenziati di Facoltà o Corsi diversi*, 1859-1823, pp. 1, 2, 3, 4, 116, 117, 118, 119, 120, 121, 123, 124, 125, 126, 127.

2 ASUT: *Esami di laurea Verbali*, XD 191, p. 59; XD 192, pp. 6, 7, 14, 49; XD 193, pp. 5, 35, 36, 45, 55, 57, 78, 90, 92, 97, 108, 180, 183, 205, 230; *Verbali di laurea 4 Jul 1902 - 14 Apr 1921*, pp. 2, 7, 39, 40, 51, 113, 114, 138, 141, 167, 170, 174, 177, 187, 198, 216, 222, 226, 230, 254, 275; *Verbali di laurea in Magistero di Scienze Naturali, Matematica, Fisica, Chimica, dal 27 Ott 1902 al 16 Nov 1925*, pp. 5, 27, 28, 48, 54, 60, 61, 77, 83, 90, 123, 169, 177, 193, 214, 228, 238, 247, 248, 249, 252, 258; *Verbali di laurea 16 Nov 1925 - 13 Feb 1935*, pp. 4, 20, 55, 56, 117, 129, 135, 142, 205, 229, 250, 273, 287, 291; *Verbali di laurea 12 Nov 1935 - 14 Nov 1947*, pp. 26, 57, 59, 111, 112, 118, 124, 126, 203.

3. Shared Cultural Features

3.1. *Jewish or Italian?*

Identifying some shared social or cultural features that might characterize these figures as a group is quite an arduous task. As Emanuele Artom, a keen interpreter of Italian Judaism, wrote:

Judaism is not a religion, because many Jews consider themselves as such without believing in God, or believing in God in a manner different from what is prescribed by Jewish theology, providing that this exists; it is not a race, because ethnologists say the contrary; it is not a homeland, because we feel bound to the land of birth; it is a fourth thing, unique in humanity: we are bound by a tradition, as one may be by a solidarity of faith, blood or places. Precisely because it is unique in the world, there is no common name that serves to indicate entities of this genre.¹

In fact, the Jews who were affirmed in the Turin cultural environment manifested a sort of indifference to their identity. Born in families directly involved in the struggles of the Risorgimento, the great majority of them had a strong sense of Italianness, corroborated by the memory of the battles fought by their fathers in the name of freedom and equality (Togliatti 1952, pp. 499-500; Alessandro Terracini 1953, p. 703; Ugo Fano 2000, pp. 177, 184; Robert Fano 2004, p. 3). On the contrary, personifying the adage according to which «a Jew is an Italian who does not go to church on Sunday», they were almost foreign to Jewish traditions and habits, while continuing, at least nominally, to profess the Jewish faith, to subscribe to communities, and to financially support their institutions.² Gino Fano would specify, for example, on the occasion of 1938 racial census:

kindly requested [to do so], I only consented for a few years to pay my annual fee [to the Turin Jewish community], as a contribution to local charity institutions.

¹ Emanuele Artom (2008), p. 13: «L'ebraismo non è una religione, perché molti ebrei si considerano tali senza credere in Dio o credendovi in modo diverso dalla teologia ebraica, dato che questa ci sia; non è una razza, perché gli etnologi affermano il contrario; non è una patria, perché noi ci sentiamo legati alla terra di nascita; è una quarta cosa, unica tra gli uomini: siamo av-vinti da una tradizione, come lo si può essere da una solidarietà di fede, di sangue o di luoghi; appunto perché è unico al mondo non ha un nome comune, che serve per indicare le entità dello stesso genere».

² See for example Archivio dell'Accademia Nazionale dei Lincei, Fondo Guido Castelnuovo: C. Segre to G. Castelnuovo, 23 Sep 1892; Biblioteca 'G. Peano' Torino, Fondo Corrado Segre: C. Segre to O. Michelli, 14 Jan 1893, 10 Feb 1893, 18 Feb 1893, 24 Feb 1893, 10 Jul 1900, 29 Jul 1905, 31 Jul 1905, 7 Aug 1905, 28 Sep 1906. In only a few cases, and even then at a considerable time distance, would the Jewish identity of some scholars, such as Corrado Segre, be emphasised (Segre Fuà 1952).

... Not converted (except from a sister, Catholic since 1921). However, we have gradually abandoned the Jewish religion over the course of 2-3 generations. Personally, already in the census of 1911 I declared that I did not belong to any religion and I have always confirmed this, even if I did consent the above-mentioned payment.¹

The mass education of Jews «solicited to consider themselves as individuals, regardless of the community they belong to»² played a role that was anything but marginal in that loss of identity. In fact, the daily sharing that occurred in classrooms contributed to attenuate the perception of a diversity. Thus, as Alessandro Terracini recalled, episodes of anti-Semitism in Turin «had always been a very small thing, which confirms how artificially that movement was created in Italy many years later».³ Events indicating the contrary were mostly due to academic rivalries and quarrels, such as those between the «Segre-Fano-Fubini's circle», with conservative leanings, and the group gathered around Giuseppe Peano and Tommaso Boggio «where indeed a wind of antagonism blew».⁴

Many Jewish mathematicians would have become painfully aware of their own identity only after 1938. Even at that moment, however, many of them would have read the purge as a politically caused dismissal rather than a racial persecution. Those in exile would often prefer to establish friendship ties «with the community of anti-Fascist Italians and sons of Italians linked to the cult of Mazzini and Garibaldi [rather than] with the several many Jewish communities ... perceived as far apart by language and tradition».⁵

3.2. *The 'Small School' of Segre*

One truly distinctive feature of a significant part of this community is related to the particular scientific filiation that they shared. In fact, almost

1 ASUT XIV B 374, 1938, *Fascicolo Razza*, file Gino Fano: «pregato, ho solo consentito da alcuni anni a pagare una quota annua, a puro titolo di contribuzione per le Opere Pie locali. ... Non convertiti (salvo una sorella, cattolica dal 1921). Abbiamo però abbandonato la religione israelitica gradualmente, nel corso di 2-3 generazioni. Personalmente, già nel censimento del 1911 ho dichiarato di non appartenere a nessun culto e l'ho sempre confermato, anche quando ho consentito al pagamento di cui sopra».

2 *Gli Ebrei*, <http://www.150anni.it>: «sollecitati dal processo stesso di nazionalizzazione a considerarsi come singoli, indipendentemente dalla comunità di appartenenza».

3 Alessandro Terracini (1968), p. 3: «gli episodi di antisemitismo erano sempre stati ben poca cosa, il che conferma quanto artificiosamente tale movimento sia stato creato in Italia molti anni dopo».

4 Tricomi (1967), pp. 18-19: «in cui spirava invece spirito di fronda».

5 Renato Treves (1990), pp. 27-28: «più con la comunità di italiani e di figli di italiani antifascisti legati al culto di Mazzini e di Garibaldi' [che non] con le comunità ebraiche assai numero-se ... lontane per lingua e per tradizione».

all Jewish graduates in mathematics at the University of Turin from the years 1888-1924 were disciples of Corrado Segre, attending his famous lectures of higher geometry and his lessons at the Scuola di Magistero (teacher training school). They had Segre as a point of reference, a com-mon leader (*Maestro*); in many cases, he was the supervisor of their de-gree dissertations and their qualification theses as teachers. Some came to know him because of the common affiliation to the Jewish commu-nity: they were Segre’s relatives, such as Beniamino Segre and Annetta Segre (1897-1944); others were family friends, like David Cytron (1887-1982), Ester De Benedetti (1896-?) and Scipione Raffaele Treves (1900-1991). The affectionate ties between the ‘venerated’ *Maestro* and these former students and friends continued well beyond the conclusion of their university studies,¹ as evidenced by some letters and documents kept in the Segre archive.²

Through his courses, and even more through his mentorship at the teacher training college, Segre instilled his main didactic beliefs in these disciples: the principal objective of teaching should be the development of the powers of induction, visualisation and reasoning; the first ap-proach to mathematics should be experimental and intuitive; the con-cepts of function and transformation (in line with the ideas of Felix Klein) should be introduced at an early level.

It is thus no surprise that the legacy of Segre’s teachings is evident in the publications by Emilio Artom, Alice Osimo (1886-?), Elsa Bachi (1894-1972), Alberto Levi (born in 1874, Beppo Levi’s brother-in-law), and oth-ers. For example, in their textbooks *Aritmetica, geometria, algebra ad uso delle scuole d’avviamento professionale* and *Geometria, ad uso delle scuole me-die inferiori* (Rocca S. Casciano, Cappelli, 1935 and 1938 respectively) Ar-tom and Osimo reprised the tenets of the lessons Segre had given to them in 1908-09, by inviting teachers to «teach to the mathematical dis-covery» and to look at the subjects from a historical perspective. Likewise Elsa Bachi, a student of Segre in 1913-15, then a teacher in the middle schools of Novara and a respected fellow of the Mathesis Association for mathematics teachers, in her handbook *Geometria piana e solida ad uso delle scuole industriali, commerciali e medie*

¹ For example, Emilio Artom’s library includes some offprints by Corrado Segre with the handwritten note: «Ai cari discepoli D’Emilio e Amalia Artom. Ricordo aff. di C.S.» («To my beloved disciples Emilio Artom and Amalia Segre, in loving memory of C.S.»). The cataloguing of Artom’s library, recently discovered in the cellars of the Department of Mathematics of the University of Turin, is currently underway. Artom’s library comprises more than 240 offprints and booklets.

² See Biblioteca ‘G. Peano’ Torino, Fondo Corrado Segre, in Segre’s address book, the letter from L. Hidalgo to Olga Michelli Segre, 4 Jun 1924 and E. ARTOM, *Lectures*, Israel.

inferiori (Torino, Paravia, 1926) invited colleagues to conduct a «semi-experimental» teaching of plane and solid geometry, to approach the reading of the text with the use of models, plates, and large-format boards mounted on walls and to lead students to discover the various properties of solids and figures. Quoting Segre's lectures at the teacher training school almost literally, Bachi explained:

I did not intend to develop rational geometry, but to facilitate for the students the orderly and synthetic recall, by fixing in mind every new concept or property with the relative consequences ... with the aim of teaching pupils to at least clearly distinguish between a verification and a proof. I have proposed some of the simplest [proofs] as exercises to accustom the student's mind to observation and reasoning.¹

In this sense, Artom, Osimo, Bachi and still other scholars could be defined the 'small School of Segre', different from the renowned Italian School of algebraic geometry of which Segre was the leader (Luciano & Roero 2016), because they constituted a network that, while not carrying out research in advanced geometry under his direction, did inherit, as-similate and insightfully apply the tenets of Segre's methodological thought.

At the same time, almost all of these teachers belonging to the «small School of Segre» attended one or more courses by Peano in infinitesimal calculus, advanced analysis or complementary mathematics, and thus had an opportunity to learn the meaning and use of his logical symbols and to meditate on the introduction of the research on the foundations into teaching and textbooks. In addition, some of them, such as Vittorina Segre (1891-1944) and Emilio Artom, maintained fruitful and long-lasting exchanges with the Peano School, by attending the 'Conferenze Matematiche Torinesi', a lecture series that Peano and his collaborators Boggio and Matteo Bottasso started in 1915 (Luciano & Roero 2008, pp. 145-149). Some textbooks and research articles benefitted greatly from such experience. For example, the methodological instances supported by Artom in his *Elementi di aritmetica ad uso delle scuole secondarie inferiori* (Bologna, Cappelli, 1922) clearly reveal the stamp of Peano's legacy in the central role assigned to logical rigour and in the will to include the recent

¹ Bachi (1926), p. VI: «non ho inteso fare della geometria razionale, bensì facilitare agli studenti il ricordo ordinato e sintetico, col fissare bene in mente ogni nuovo concetto o proprietà con le relative conseguenze ... nell'intento che gli allievi imparino almeno a fare netta distinzione fra verifica e dimostrazione; ho proposto alcune delle più semplici [dimostrazioni] come esercizio per avvezzare la mente dello studente all'osservazione e al ragionamento».

research output on the foundations of arithmetic (and above all Peano's axioms for natural numbers) into teaching.

In the group of scholars who intertwined a lively dialogue with both the research teams in Turin, one cannot omit Alessandro Padoa (1868-1937) and Guido Ascoli (1887-1957). Padoa, who came to Turin from Bologna to complete his university studies, chose Segre as advisor of his thesis (1895). Although being trained by Segre in research on the foundations of geometry, he soon approached the Peano School, becoming one of Peano's closest collaborators and fervent admirers. In his educational practice, in his work, and even more in his interventions in the Ligurian chapter of the Mathesis Association, where he re-came into contact with other former protégés of Segre, such as Alice Osimo,¹ Vittorina Segre and Alberto Levi, Padoa defended many key points of the logical-deductive approach typical of the Peanians. In particular he insisted on the rigour of language, on ideographic symbolism, on the value of recursive definitions and on the convenience to merge into teaching some of the issues of foundational critique (Padoa 1902). At the same time, however, he also embraced several elements of Segre's *lectio*, starting from his considerations on the role of intuition in geometry (Padoa 1926), on the importance of addressing elementary mathematics from a higher standpoint (Padoa 1910), etc.

In his turn Guido Ascoli, who arrived in Turin in 1923 as a professor of mathematics and physics at the newly-created Galileo Ferraris lyceum, soon intertwined exchanges with Emilio Artom (his colleague at the lyceum), Terracini, Fubini, Peano and other members of both the Turin research teams. The years at the 'mythical Galfer', as the lyceum was affectionately called, were particularly productive and happy ones for Ascoli who published the volume *Lezioni elementari di Analisi Matematica per i licei scientifici* (Torino, Petrini-Gallizio, 1924). This textbook, greatly appreciated, is a further example of the harmonic synthesis of the methodological instances sustained by the Schools of Segre and Peano. Ascoli drew from Peano the belief that the teaching of analysis requires «sufficient generality and rigour, that rigour which is a clue of intellectual honesty».² Meanwhile, from Segre he inherited the conviction that rigour should be reconciled with the need for «simplicity, measure and coordination », and

1 In the Ligurian chapter of the Mathesis Association, Alice Osimo passionately defended the rights of female graduates to teach mathematics and science in technical middle schools for boys. See in particular *Relazione della prof. dr. Alice Osimo*, «Bollettino della Mathesis», VI, 1914, pp. 66-67.

2 Ascoli (1924), p. V: «sufficiente generalità di vedute e rigore, quel rigore che è onestà intellettuale».

warned of the risk of pursuing a purely analytic ideal of mathematics, free from blending with – and being influenced by – other disciplines.¹

As a result of this dual intellectual filiation, many of the Jewish mathematicians mentioned here were really able to balance and blend the legacies of both Segre and Peano. In this sense, many of these authors appear as authentic ‘bridge’ figures between the two research Schools that flourished in Turin, commonly but unjustly depicted as antagonistic and impermeable, devoid of collaborations and mutual influences.

After Segre’s death in 1924, the baton of *Maestro* was taken up by his protégés Fano, Fubini and Terracini. Under their guidance, among others, Iris Todros Debenedetti from Valparaiso (Chile), Fausta Segré (1901-?), cousin of Emilio Segré, and Lia Errera Foà were trained. All of these pursued some kind of scientific activity after their university studies: Lia Errera Foà entered the world of teaching in Turin (Errera 1984; Errera 1990); Iris Todros published some works in mathematical and educational journals; Fausta Segré translated into English some papers, including the famous 1929 lecture by Orso Maria Corbino *The New Goals of Experimental Physics* under the auspices of the Italian Society for the Progress of Science (Emilio Segré 1993).

3.3. *A Gender Balance: Jewish Female Schooling*

In the previous pages several female teachers and researchers have been mentioned. One of the most significant elements of the network that we are examining is the fact that it included many women.

Having grown up in a context that offered a genuine equality of educational opportunities, Jewish girls were in a privileged position compared to their classmates. In Turin, since the pre-Unity period, they had been admitted to Jewish schools and had been able to count on the support of some welfare structures, such as the *Pia Società femminile Israelitica*, which since 1832 had helped women to undertake jobs and qualify as schoolteachers, supported them with scholarships, and set up prizes for deserving pupils (Benvenuto Terracini 1932). Further, in Turin

¹ The dual influences of the Schools of Segre and Peano on Ascoli’s textbook is also reflected in some details of content. For example, as Peano had recommended in *Sulla definizione di limite* («Atti della R. Accademia delle Scienze di Torino», 48, 1913, pp. 750-772), Ascoli introduces the integral before the derivative, moving from the method of exhaustion for the calculus of the areas. On the other hand, following the suggestions of the ‘geometers’ Segre, Castelnuovo and Enriques, Ascoli enhances the sections devoted to the applications of calculus to other disciplines (physics, natural sciences, etc.).

there were no fewer than five boarding schools for girls.¹ The teaching offered there was actually aimed at providing girls with the skills necessary to manage a household efficiently (for example, basic notions of home economics, hygiene, pharmacopoeia, etc.), but there were also some cases of teenagers who, after receiving their licenses from these colleges, pursued their studies at university. The result of the Jewish female education was important. In the Faculty of Sciences, young Israelite women constituted 6% of the graduates in the period of 1892-1938. The majority of them, after having obtained the degree and the license, opted for careers in schools as teachers, headmistresses, inspectors, supervisors of summer camps or orphanages, etc. In such a circumstance, gender played a part. In fact, such professions were considered particularly suited to women, being conceived as natural extensions of parental cares (Dolza 1987).

In this female universe, Ida Terracini stands out. Born in Asti, Ida attended the Jewish kindergarten and primary school in that town and then the Alfieri lyceum in Turin. In 1888 she enrolled in the degree program in pure mathematics at the University of Turin, where she gave proof of an unusual multiplicity of interests, by attending eleven elective courses, in addition to those required by the curriculum. In July 1892 she became the first woman to take a degree in mathematics. Turin news-papers enthusiastically reported the event:

A female doctor of mathematics. Yesterday in our University Miss Ida Terracini from Asti graduated in mathematics. In our University she is the first or one of the first women to graduate in that faculty. We remark for the admiration of our female readers this sister of theirs, who is on the leading edge in the conquest of a new status for women. Our congratulations to Dr. Terracini.²

1 These were: the Jewish-Italian women's high school, annexed to the Collegio Colonna e Finzi in 1855, the private Jewish female school managed by Elisa Cantoni from 1859, the institute led by Adele Levi and Clotilde Jarach, founded in 1869, the Israeli female school Stella Fubini-Treves created in 1884, and the boarding school directed by Ida Terracini since 1894. See AET: *Comunità ebraica di Mondovì, Archivio Storico, Corrispondenza, Lettera a stampa dell'Istituto Convitto femminile delle maestre sorelle Levi*; Baricco (1869), p. 197; B. Felice, L. Laide Tedesco, *Per l'inaugurazione in Torino del nuovo edificio delle scuole infantili ed elementari Colonna e Finzi e della scuola femminile Stella Fubini-Treves*, Torino, Paravia, 23 Nov 1884; *Statuti organici delle opere pie Colonna e Finzi e Abram e Stella Fubini coniugi Treves in Torino*, Torino, Tip. lit. Foa, 1894; «L'Educatore Israelita», 3, 1855, pp. 365-366; 7, 1859, p. 288; 12, 1864, p. 117; 14, 1866, p. 300; 15, 1867, p. 233; 16, 1868, p. 251; 20, 1872, p. 22; VI, 28, 1880, p. 347; 32, 1884, pp. 402-403; 36, 1888, p. 296; 42, 1894 p. 350; 47, 1899 p. 318 «La Gazzetta piemontese», 11 Jul 1869.

2 «La Gazzetta Piemontese», 19 Jul 1892: «Una dottoressa in Matematica. Ieri nella nostra Università ha conseguito la laurea in matematica la signorina Ida Terracini. Nel nostro Ateneo è la prima o una delle prime donne che consegue la laurea in tale facoltà. Segnaliamo all'ammirazione delle nostre lettrici questa loro consorella che si trova alla vanguardia nella conquista del nuovo stato della donna. Alla signorina Terracini le nostre congratulazioni».

The magazine «Il Vessillo Israelitico» also celebrated Ida Terracini «the first Italian young woman who purposely dedicated herself to studies [in mathematics]».1 Soon afterwards, Ida was qualified to teach and founded her own boarding school for Jewish women in Turin, also open to students of other religions. In addition to directing this private college, she was also a greatly appreciated teacher and headmistress in many local public schools.2

No less emblematic is the path of Costantina Levi, who was the second woman to receive a degree in mathematics at the University of Turin.3 Born in Turin on 9 March 1870, into a family of Jewish bourgeoisie, after having completed secondary studies at the Cavour classical lyceum, she enrolled in the degree program in mathematics. A disciple of Segre and Enrico D'Ovidio, Levi showed good talent for geometrical research, to the point that she was invited to publish an abstract of her dissertation. She would become a 'pillar' of Turin's educational milieu, being in service for decades at the Alfieri lyceum.

The Jewish parterre within the natural sciences is no less rich. It includes, in particular, Rosa Segre (1879-1966) and Marisetta Treves (1908-1973). Rosa Segre, under the advisement of Lorenzo Camerano, carried out some interesting studies in zoology and ichthyology, which merged into a large survey that appeared in the «Bollettino dei Musei di Zoologia ed anatomia comparata della R. Università di Torino» (XVII, 1902, n. 429, pp. 1-42). A beloved teacher in secondary schools, she in fact received a medal from the principal of the Sommeiller technical institute in Turin, in recognition of her decennial service. Rosa Segre's daughter, Maria Susetta, known as Marisetta, followed, so to speak, in her mother's foot-steps and, after having obtained the degree and the license in 1929, she started working at the Sella lyceum in Biella. She also published research works and textbooks in geology, lithology, geography and mineralogy (Milano, Signorelli, 1935, 1937).4

1 «Il Vessillo Israelitico», 40, 1892, p. 265: «Ida Terracini di Asti, la prima giovinetta italiana che si sia data di proposito a quello studio [di Matematica]».

2 See «La Stampa», 28 Jun 1900 and 6 May 1911.

3 Cf. «La Gazzetta Piemontese», 23 Jul 1893, p. 3 and Archivio dell'Accademia Nazionale dei Lincei, Fondo Guido Castelnuovo, C. Segre to G. Castelnuovo, 20 Jul 1893.

4 See AET: *Carte di famiglie e di persone, Versamento 2009, Famiglia Treves Fubini, Rosetta Segre in Treves (1932-1966, RST1, RST2, RST3, MT1, MT2.*

4. The Racial Laws of 1938

4.1. *Institutional Application*

Because the Jewish presence represented a very important aspect numerically and qualitatively in the Turinese milieu of scientific culture, it is not surprising that the process of Aryanisation imposed by the Fascist regime through the approval of racial laws had a shattering impact. As is well known (Vesentini 1990; Israel & Nastasi 1998; Israel 2010; Sarfatti 1988), between August and December 1938, 279 Jewish teachers and headmasters were removed from their positions, 229 scholars were dismissed from universities, and the administrative staff fired. Jewish students were thrown out of schools of every order and level (Signori 2009). The use of textbooks by Jewish authors was prohibited in all State institutes (this was the so-called procedure of *Bonifica libraria*) (Fabre 1998). As far as Turin is concerned, the data of the purge can be summarised as follows: at the University nine full professors, four associate professors and forty-three tenured lecturers were dismissed from their roles.¹

The Faculty of Sciences only left three full professors (Gino Fano, Alessandro Terracini, Guido Fubini), one associate professor (Bonaparte Colombo) and two tenured lecturers (Giulio Bemporad (1888-1945) and Arturo Debenedetti (1898-1986)) (Rinaldelli 1997-1998). The dimensions of the expulsion process in middle and secondary schools world are even more impressive: eleven secondary school teachers,² five working in profession-oriented middle schools³ and three others at the technical institutes were removed (*La Stampa Torino*, 30 August 1938, p. 7; 2 September 1938, p. 5; 3 September 1938, p. 6). More than 386 students were expelled,⁴ forty

¹ See ASUT XIV B 374, 1938, *Fascicolo Razza* (partly digitized in ASUT, Catalogue of the exhibition 'A difesa della razza', www.archivioistorico.unito.it) and, in ASPT, the folder Cat. 1, X, fasc. 2, *Censimento del personale di razza ebraica*. As gender history has recently highlighted, racial laws specially hit «the other half of the sky» (Simili 2010; Galoppini 2011; the website <https://scienzaa2voci.unibo.it>). At the University of Turin, one of those removed from service was the 1986 Nobel Prize winner in physiology Rita Levi Montalcini, then a volunteer assistant at the Mental Health Clinic, who declared in the racial census sheet to be «Jewish by both parents, enrolled in the Jewish community and professing Jewish religion» («ebrea da parte di entrambe i genitori, iscritta alla comunità israelitica e professante la religione ebraica»).

² To be precise, three from the D'Azeglio, Alfieri and Gioberti classical lyceums, four from gymnaseums, one from the Galileo Ferraris scientific lyceum, and three from institutes for the training of primary school teachers.

³ This datum unfortunately is only approximate.

⁴ In ASUT the folder XI B 383, 1939, *Studenti*. A dozen Jewish students were «suspected for inclusion in the lists» («sospettati per l'inserimento negli elenchi»). Instead, under the royal decree *Integrazione e coordinamento in unico testo delle norme già emanate per la difesa della razza nella Scuola*

from the d'Azeglio classical lyceum alone (Liceo Gioberti *et alii* 2012, pp. 43-46; 117-124, 167-170). Finally one must add to these data the numerous teachers and headmasters who had trained in Turin but worked in Piedmont or in other regions: the mathematics teachers Guido Voghera (Pinerolo), Ugo Levi (Saluzzo), Amalia Segre Norzi (San Remo), Bianca Ottolenghi (Mantova), Annetta Segre (Genova), and Adelaide Diena (Racconigi); teachers of natural sciences and chemistry Maria Susetta Treves (Biella), Olga Viterbi Beer (Perugia) and Raffaele Iaffe (the headmaster in Casale Monferrato).

The discriminatory decrees against Jews were rigorously applied in Turin schools and the universities. In the University of Turin registers, the pages of studies careers were immediately marked with the acronym *RE* (*Razza Ebraica*, Jewish Race) written in red pencil. The same is true for the pages of the minutes of sessions of thesis defences. The awards for deserving students and scholarships established in the memory of famous Jewish intellectuals – such as the Corrado Segre prize – were renamed. The Aryanisation did not omit minutiae such as the removal of geographical maps and scientific instruments drawn by Jewish authors or the constraint, for students, to do exams sitting in the last desks.¹

Above all the Ministry imposed a didactic programme that was 'frankly racist', inviting to seize all possible

pretexts to 'make children feel' the difference between Order and disorder, Construction and destruction, Love that unites and the hatred that divides, namely between Fascism and Judaism. For the first evaluation of the races, destined to become instinctive, great portrayals are very useful: for example the Jewish race drawn with the characteristics of antipathy against a sinister backdrop of destruction, Bolshevism and avarice; in contrary, the Italian race presented against a background of victories, genial and creative works.²

italiana, which allowed Jewish university students already enrolled to complete their studies, Enrichetta Terracini (1914-?), Gabriella Segre (1914-?), Ester Valabrega (1916-2010), Emma Vita Levi (1918-?) and Silia Beer (1919-?) succeeded in graduating, respectively, in natural sciences, mathematics and chemistry, in the years 1938-1941. In order to have a chance of salvation Emma Vita Levi, whose mother was a Catholic, was hurriedly baptised on 29 November 1938, just one month after having won the gold medal from Mussolini (Thomson 2014, p. 87).

¹ This practice was recalled by Elda Valabrega, the first student to graduate in mathematics after the repeal of the racial laws, on 28 January 1946.

² Cottone (1940), p. 65: «pretesti per far "sentire" ai fanciulli la differenza che corre fra l'Ordine e il disordine, la Costruzione e la distruzione, l'Amore che unisce e l'odio che divide, vale a dire tra il Fascismo e l'ebraismo. Per la prima valutazione delle razze, destinata a diventare poi istintiva, sono utilissime le figurazioni a grandi linee: per esempio la razza ebraica disegnata con le caratteristiche dell'antipatia su uno sfondo bieco di distruzione, di bolscevismo e di avarizia; la razza italiana invece presentata su uno sfondo di vittorie, di opere geniali e creative».

Despite a bit of upheaval, Turin's schools conformed to these stances. For example, the d'Azeglio and Alfieri lyceums and the Sommeiller technical institute agreed to actively participate in the Racial Exhibition that would have been held in Rome in April of 1940, under the auspices of the Ministry of National Education. The minutes of teachers' meetings dramatically reflect the occasion. At the Alfieri lyceum-gymnasium, the headmaster emphatically wrote to the Ministry:

Racial consciousness, viewed as awareness of a superior human race, should it seems to me be the natural consequence of a higher, clearer and more educated national spirit. All teachers in this school work diligently towards the training of such.¹

At the Sommeiller technical institute, there was even a proposal for the creation of an anthropometric laboratory:

Faithful to the laws laid down by the Regime, Ministry and Headmaster, the teachers of this school explain and promote both systematically and not the categorical need to defend our race It would be very useful for all teachers to acquire a grounding in biology, physiology and psychology, as needed by an educator, and to put them into practice. For this very reason, I suggest the creation within this institute of a medical-psychological laboratory, where pupils could be regularly checked and awarded precise and updated bio-psychological charts. What an invaluable aid this would be to teachers, a huge benefit for the school, an immense improvement of the race, assistance for career choice and professional selection!²

However, some of the city's teachers (even some of those who were supporters of Fascism) refused to follow the Regime in this racist trend and

¹ See ASTO: *Minutes of teachers riunions of liceo ginnasio V. Alfieri*, 27 Feb 1940, digitalised in http://www.uciimtorino.it/fonti/documento_4_parte2.htm: «La coscienza razziale, intesa come consapevolezza di una superiore dignità umana, mi pare debba essere la naturale conseguenza di una sempre più alta, chiara e illuminata coscienza nazionale. Alla formazione di questa coscienza lavorano con fede tutti gli insegnanti di questa scuola».

² ASTO: letter of the headmaster of Technical Institute G. Sommeiller to the Ministry of Demography and Race, 26 Feb 1940, digitalised in http://www.uciimtorino.it/fonti/documento_4_parte2.htm: «Fedeli alle direttive del Regime, del Ministero e del Preside, gli Insegnanti di questo istituto, sia sistematicamente sia occasionalmente, spiegarono e propagandarono l'impegnativo categorico della difesa della razza. [...] Molto utile sarebbe che tutti gli insegnanti possedessero quelle nozioni di biologia, fisiologia e psicologia che sono indispensabili a un educatore, e le mettessero in pratica. Appunto per questo io vagheggio la creazione nell'istituto di un gabinetto medico-psicologico, in cui un sanitario competente visiti periodicamente gli alunni, redigendo e tenendo aggiornata per ciascuno un'accurata scheda bio-psicologica. Quale preziosa guida ne trarrebbero gli insegnanti, quale immenso vantaggio per la scuola, quale miglioramento la razza, quanti utili miglioramenti per l'orientamento e per la selezione professionale!».

carried out a series of subtle rebellious acts. Maria Mascalchi, for example, a niece of Francesco Severi who was a mathematics teacher at the d'Azeglio lyceum and an intellectual of proven militancy, visited the families of some of her Jewish pupils to plead with them to continue their studies privately.

4.2. The Consequences of the Purge on the Local Supply of Mathematical Instruction

Racial laws resulted in a traumatic shock for Turinese Jews, the majority of whom were perfectly integrated and even assimilated to the rest of the citizenry. Between 1938 and 1943, the mathematics teachers mentioned earlier and many other former disciples of Segre, Fano, Terracini and Fubini who worked in finance, industry, as employees in scientific libraries and museums, etc., either lived in hiding, escaped to the mountains to join the Resistance, or were deported and killed in extermination camps. A very few mathematics teachers managed to escape abroad. Elvira Noemi Luria (1900-?) and Ester de Benedetti (1896-?) did enter Switzerland.

At the Galileo Ferraris lyceum, Emilio Artom was expelled amidst the general indifference of his colleagues.¹ The same fate concerned Ugo Levi, a protégé of Alessandro Terracini and Enrico Bompiani and a talented researcher on three-dimensional geometric varieties (Ugo Levi 1933), who was dismissed from the classical lyceum in Saluzzo and took refuge in the mountains. Amalia Segre (1898-1943), distinguished pupil of Segre and wife of the chemist Guido Norzi, was fired from the high school of San Remo and died of cancer in clandestinity shortly after. Her daughter Anna Luciana (born in 1932), was arrested together with other relatives and died in Auschwitz-Birkenau in 1943 (Veziario 2007, p. 133). Retired since 1935, Ida Terracini courageously faced the period of racial persecutions, and finally sought refuge in the Piedmont countryside.² Alice Osimo, who had converted to the Catholic faith, also lived in hiding in her hometown Piacenza, with the help of her former colleagues and friends:

To serve the good was your aspiration and the chrism of your dignity Even when, in a time of inhuman perversion, your home was devastated and all the

¹ Archive of the Galileo Ferraris lyceum, 'Stato del Personale', s.v. Emilio Artom.

² See Centro Studi Piero Gobetti, Turin, Fondo Zino Zini, serie 11, UA 61, I. Terracini to her friend Laura, 19 Apr 1939; s. 11, UA 62. In 1938, the daughter of Ida Terracini, Maria Luisa Zini, a teacher at the D'Azeglio lyceum, was also kept under surveillance because of her Jewish origins on her mother's side.

creatures that were your reason to live were dispersed, you continued in your school your tender offer of love, multiplying your generosity as men multiplied your suffering. In that moment you did not bend. Composedly courageous, you moved among us, demonstrating your inner grief only by the flashing, instant-ly quelled, of your gaze.¹

Instead, a tragic destiny of deportation and death awaited Vittorina Segre (1891-1944) and Annetta Segre (1897-1944). Both had graduated under the advisement of Boggio, in 1914 and in 1918 respectively; both had been supervised by Segre for their qualification theses at the teacher training school and had also maintained scientific relationships with the team guided by Peano, by attending the ‘Conferenze Matematiche Tori-nesi’. Vittorina, author of several works of rational mechanics, taught in the technical schools of Pinerolo and Saluzzo. Annetta held a chair at the Lambruschini teacher training institute in Genoa. Both were animated by strong patriotic beliefs – they had worked in the *Laboratorio delle studentesse per i combattenti* during the first world war (see <http://www.grandeguerra.unito.it/items/show/188>); both were appreciated at the national level, as members of the Mathesis Association and of the Italian Society for the Progress of Science. Vittorina Segre and her step-daughter Betty Foà, just fifteen years old, were arrested in San Remo and died in Auschwitz in winter of 1944 (Veziario 2007, p. 194). Annetta was arrested in Genoa and interned in the concentration camp of Chia-vari, before being deported to Auschwitz, where she also died in winter of 1944.²

Still another fate awaited a tiny group of members of the ‘small School of Segre’ who entered the staff of the newly established Jewish schools. In fact, the racial laws stated that in the presence of a sufficient number of pupils, Jewish communities could set up their own para-state institutes under the leadership of an Aryan commissioner (Piusi 1997). In Turin, such schools were not to be set up *ex novo*; instead the old Collegio Colonna e Finzi was to be reformed (*Scuole Israelitiche* 1938; Corinaldi 1988; Bonino 1999, pp. 65-92; Cavaglion & Romagnani

¹ Private Archive of Osimo family, *Per il passaggio della salma della Dott. Alice Osimo alla scuola G. Migliara*, fol. 2r: «Servire il bene fu la tua aspirazione e il crisma della tua dignità [...]. Anche quando in un tempo di aberrazione disumana il tuo focolare fu devastato e furono disperse tutte le creature che a Te erano ragione di vita, tu continuasti nella scuola la tua diuturna offerta d’amore, moltiplicando le generosità per quanto gli uomini ti moltiplicavano le sofferenze. Allora non ti piegasti. Compostamente animosa, passavi tra noi, solo denunciando l’intimo affanno col lampeggiare subito domato dello sguardo».

² See CDEC, *Fondo Comitato Ricerche Deportati Ebrei, Comitato Ricerche Deportati Ebrei, Ufficio di Genova, Comunità israelitica di Genova, 1943-1948*, envelope 5, fasc. 17.

2002).¹ Alessandro Terracini, full professor of geometry dismissed from the University of Turin, together with his brother Benvenuto, an eminent linguist, investigated the modifications to be introduced in order to make the Collegio Colonna e Finzi more secular and similar to the standards of national institutions:

I therefore believe that the problem ... is very important and that, if new difficulties do not present themselves, it is our urgent duty to solve it, in the best way we can, in order to guarantee our children, within the limits of what is possible, the education they must have. My observations regarding this are currently: a) the need for our schools to be organised with programmes that are in no way inferior to those of the government; b) the consequent need to keep the religious part to a minimum; c) I don't know whether or to what point existing buildings and equipment can be used but it's necessary to have instruments for a physics laboratory.²

In Turin the idea of offering the students an eminently technical instruction, an idea backed by a quite large part of the Italian Union of Jewish Communities (Minerbi 1998), was rejected. The Collegio Colonna e Finzi was thus restructured, establishing a professional training school (*scuola di avviamento professionale*) for 13-20 students, a class of technical instruction with 5-16 pupils, some accounting courses delivered by Ester Levi, and a complete classical curriculum (five classes of gymnasium, for an overall population of 49-66 pupils, and 3 classes of lyceum attended by 22-34 students). The mathematics courses for secondary instruction were entrusted to Bonaparte Colombo and Ugo Levi, and the science courses to Olga Viterbi Beer (1890-?)³ and Marisetta Fubini Treves. In the middle school, the courses in mathematics and

1 At that moment, the Colonna e Finzi Institute counted five classes of primary school, entrusted to five teachers, for a total of about a hundred pupils. To these are to be added forty children in the Israeli kindergarten. Moreover, since 1935, an after-school activity had already been organised in Turin for middle and secondary school students. It had enjoyed a good success, arriving to eighty participants, assisted by five teachers of mathematics, three of accounting and bookkeeping and three of natural sciences.

2 A. Terracini to B. Terracini, 8 Sep 1938, in Lore Terracini (ed., 1990), p. 448: «Ritengo dunque che il problema di una scuola media, a cui ho già accennato ieri, sia molto importante e che, se non si frappongono nuove difficoltà, sia un dovere impellente di risolverlo, e nel modo migliore, per non far mancare ai nostri figli nel limite del possibile quell'istruzione di cui non devono mancare. Le mie osservazioni in proposito al momento sono: a) necessità che la scuola sia organizzata con programma in nessuna parte inferiore a quello governativo; b) conseguente necessità di limitare al minimo la parte confessionale; c) non so se e fino a che punto si possano utilizzare locali e impianti esistenti ma occorreranno strumenti di fisica».

3 Olga Viterbi Beer's family and career documents are kept in Andrew J. and Erna Viterbi Family Archives, University of Southern California, <http://digitallibrary.usc.edu/cdm/landingpage/collection/p15799coll117>.

natural sciences were taught by Adelaide Diena (1900-1981), graduated in mathematics in 1921 under the direction of Corrado Segre, dismissed from the professional school of Racconigi, a small town near Turin. In the years 1942-43, the last period of activity, Amalia Segre (1891-1972), wife of Emilio Artom, and a beloved disciple of Corrado Segre, also worked at the Collegio Colonna e Finzi as a substitute teacher of mathematics. In the post-war period she would become headmaster of the institute, renamed after the memory of her son Emanuele, a partisan belonging to the famous 'Justice and Liberty' brigade, who was tortured and killed by the Nazis.¹ Guido Ascoli also taught in a Jewish school, commuting daily between Turin and Milan, where he taught at the local Jewish lyceum.

For these teachers, all of whom arrived from state institutes, the racial laws would not only determine a dramatic awareness of their 'identity' but also a sort of return to their roots, in the framework of working for the first time in their lives in contact with an entirely Jewish staff and student body. As far as contents, although these scholars were not required to distribute ideological propaganda or to propound the teaching of Fascist culture, they were not allowed to deviate from the official syllabi; for example, they were forced to adopt the textbooks approved by the state. However, they tacitly rebelled in their cultural and ethical choices, encouraging pupils to save their critical freethinking skills (Emanuele Artom 2008; Jarre 2003, pp. 67-68). Reversing the words of an anti-Semitic press, they continued developing 'a program of studies marked by that universal and international stamp which was one the worst and most pernicious characteristics of dishonest Judaism'.²

4.3. *Fleeing from Turin*

As we have said, the purge of 1938 had dramatic consequences for the University of Turin and the Politecnico, whose departments of mathematics suddenly lost Fano, Terracini, Fubini and Colombo. Their dismissal triggered a series of institutional, epistemic and social changes in culture and scholarship, whose dynamics can be read in two perspectives: the global one, which views scientific change as a «re-organization of resource ensembles», trying to move beyond the classic discourse of cultural loss and gain

¹ Amalia Segre's documents, together with her family and professional correspondence in the years 1935-1970 are kept in the AET and in the CDEC.

² «La Stampa», 3 Sep 1938: «un programma a carattere universalistico internazionaleggiante, in cui consiste uno dei tipici programmi ed una delle più specifiche forme di pericolosità della razza giudaica».

(Ash 1996, 2008), and the individual perspective, that of personal and professional destinies.

With regard to institutional change, one should take into consideration the fact that, in addition to losing their chairs, Jews had their goods confiscated (Fabio Levi 1991, 1998), were purged from academies and learned societies (Capristo 2002), as well as being thrown out from other places of mathematical networking. For example, Fano and Fubini were expelled from the Turin Academy of Sciences; five other fellows were dismissed from the Royal Academy of Medicine. At the same time Fano was removed from the direction of the Special Mathematics Library and banned from the mathematical and physical Seminar of the University of Turin and the Politecnico, which he had actually created together with Terracini and Fubini. This complete upheaval in the academic staff had a series of consequences for the local research traditions and also affected the dynamics of promotions and displacements in and from other institutions. The desire of the Fascist authorities to show that the Jewish contribution to Italian mathematics had been irrelevant¹ was instrumental in augmenting the speed and brutality of the turnover.

With regard to the individual perspective, the scientific change should be evaluated in terms of personal fates. Here we have to deal with a large and nuanced spectrum of experiences. However, in general terms, we can state that the majority of purged mathematicians first tried to re-cover their rights and livelihoods through the request of special treatment based on their civil or military merits (*richiesta di contro-discriminazione per distinte benemerienze*). Having failed to obtain this, they decided to emigrate ‘looking for a space of intellectual survival’.²

The first to leave Turin was Fubini, who had also been among the first to attentively monitor the persecution of German Jews and to keep his colleagues informed.³ Even before racial laws were issued, Fubini had perceived the spread of anti-Semitic feelings, when the National Research Council had refused to publish a work on the Laplace transformation that he had written in collaboration with Aldo Ghizzetti, «because one of the authors was Jewish» (Ghizzetti 1981). Forced to leave his position of associate professor (*professore incaricato*) of higher analysis at the Faculty of Sciences,⁴ and to resign from his chair of infinitesimal

1 See L. Berzolari to G. Vacca, 14 Dec 1938, in Nastasi & Scimone (1995), pp. 11-12.

2 Lore Terracini (1989), p. 337: «uno espacio para sobrevivir intelectualmente».

3 Fubini to Levi-Civita, 14 Apr 1933, in Nastasi & Tazzioli (2000), pp. 125-126.

4 The documents concerning Fubini’s purge from the faculty of science have been lost.

analysis at the Politecnico,¹ in October 1938 Fubini took refuge in Paris with his wife Anna Ghiron and his son Eugenio (1913-1997), a top physicist from the Physics Institute at the University of Rome La Sapienza in Via Panisperna.² In March 1939, foreseeing the invasion of France by the Nazis, he reached the United States, where he was hosted at Princeton's Institute for Advanced Study.³ He was one of the few Italian scientists who managed to find a position in the United States, thanks to his international partnerships with Oswald Veblen and other outstanding mathematicians,⁴ and thanks to the prestige he enjoyed abroad. After the initial period of exile spent in Princeton, Fubini moved to New York, where he taught at New York University until his death on 9 June 1943.

Fubini was followed by Terracini who had also been quick to interpret the signs of the intensifying of the anti-Semitic campaign, and to think of emigrating to ensure «the present and future of himself and his sons».⁵ As early as August 1938 Terracini consulted with Tullio Levi-Civita and, following his advice, he immediately began to seek a position in the United States. Despite Veblen's endorsement, however, the search was ineffectual.⁶ Terracini spent the winter of 1939 in Turin in «voluntary isolation» (Alessandro Terracini 1968, p. 121), surrounded by the affection of his former colleagues Francesco Tricomi and Pietro Buzano. However he did not give up, and began to look at the possibility of seeking refuge in South America. On 5 June 1939 he received a first call from the University of Rio de Janeiro; a few days later the dean of the University of Tucumán, Arturo M. Guzmán, invited him to teach a mathematics course in the

1 See ASPT, personal dossier of G. Fubini: R. D'Elisei to Fubini, 12 May 1937, Fubini to G. Vallauri (rector of the Politecnico), 10 May 1938; Vallauri to Bottai, 11 May 1938, Vallauri to the police commissioner of Turin, 30 May 1938; Notification of relieve from service, 7 Oct 1938; Vallauri to Fubini, 16 Oct 1938; 19 Oct 1938; 25 Oct 1938; Vallauri to Bottai, 26 Oct 1938; career certificate, 9 Dec 1938; Vallauri to Fubini, 10 Dec 1938.

2 See ASPT, personal dossier of G. Fubini: Fubini to Vallauri, Paris 1 Nov 1938; Paris [December] 1938; N. Vigna to Fubini, 10 Dec 1938; Vigna to A. Bibolini, 10 Dec 1938; Fubini to Vallauri, Paris 16 Dec 1938; Vigna to Fubini, 20 Dec 1938; Fubini to Vigna, 22 Dec 1938; Fubini to Vigna, Paris 5 Jan 1939; Paris 13 Jan 1939; Vigna to Fubini, 3 Feb 1939.

3 See ASPT, personal dossier of G. Fubini: A. Bibolini to Fubini, 29 Apr 1939; Bottai to Fubini, 27 Apr 1939; Bibolini to P. Calliano, 30 May 1940; Bibolini to Bottai, 1 Jun 1939; P. Calliano to Bibolini, 18 Jun 1939. See also in AET: Fubini to P. Calliano, Princeton 27 Apr 1939 and New York 15 Mar 1940.

4 Levi-Civita to Veblen, 30 Oct 1938, in (Nastasi 1993, p. IV).

5 Bompiani 1970, p. 6: «Il presente e l'avvenire suo e dei suoi figli».

6 Oswald Veblen Papers (Library of Congress, Washington DC), Refugees, Terracini, Alessandro, 1938-43: Terracini to Veblen, 16 Sep 1938; Veblen to W.C. Graustein, 30 Sep 1938; Veblen to E.P. Lane, 30 Sep 1938; Lane to Veblen, 3 Oct 1938; Veblen to Terracini, 4 Oct 1938; Terracini to Veblen, 16 Oct 1938; Terracini to Veblen, 29 Mar 1939; Veblen to Terracini, 18 Apr 1939; Terracini to Veblen, Oct 1939; Terracini to V. Snyder, 6 Aug 1944; Snyder to Terracini, 22 Aug 1944; Snyder to Terracini, August 1944; J. von Neumann to Snyder, 26 Aug 1944.

Faculty of Engineering there.¹ The Terracini family boarded a ship in Genoa on 16 August; they arrived in Buenos Aires on 3 October and few days later, on 11 October, Terracini gave his first lecture, in Spanish, at Tucumán.

In his turn, Fano, dismissed from both his chairs of projective and descriptive geometry at the University of Turin and at the Politecnico,² for several months opposed the idea of betraying his homeland for a ‘hostile country’ like the United States (Ugo Fano 2000, p. 179). Finally, in 1940, he was convinced to repair to Switzerland by his sons Ugo (1912-2001), one of the so-called «Via Panisperna Boys» and Roberto (1917-2016), then a student of engineering:

The 1938 dismissal from his professorship, his having to seek refuge in Switzerland and the dispersion of his family were very traumatic for my father because they amounted to the collapse of the three pillars of his life: his family, his Country and his profession. Those events also caused the only serious disagreement between my parents: my mother [Rosetta Cassin] wanted to follow her children to the United States, while my father, as he told me before my departure, would never go to a country likely to be at war with Italy. They adapted their lives to the realities of the times, and lived for seven years in a room of modest size in a small hotel in Lausanne, with father resuming his work routine at a small desk in that room. (Robert Fano 2004, p. 3)

The last one to flee, fearing for the safety of his family, was Bonaparte Colombo.³ He left in October 1943, when Turin was already occupied by the Nazis, and after the destruction of the Synagogue and the annexed Collegio Colonna e Finzi, where he had worked since the autumn of 1938. Colombo reached Switzerland, where he would remain until May 1945. Thanks to the help of Gustavo Colonnetti and Gino Fano, he joined the ‘faculties’ of Architecture at the Lausanne and Huttwil internment camps where he resumed teaching special mathematics (*matematiche speciali*) and rational mechanics.⁴

To these names should be added those of Beppo Levi and Beniamino Segre. Among the earliest protégés of Corrado Segre, under whose direction he had worked in the years 1896-99, Beppo Levi was relieved from his chair of algebraic analysis at the University of Bologna, in

¹ Terracini to Levi-Civita and Guzmán to Terracini, 9 Jun 1939, in Nastasi & Tazzioli (2000), p. 401.

² See ASUT XIV B 374, 1938, ‘Fascicolo Razza’, file Gino Fano and ASPT, personal dossier of G. Fano: Vallauri to Fano, 25 Oct 1938, Fano to Vallauri, 29 Oct 1938.

³ ASUT XIV B 374, 1938, ‘Fascicolo Razza’, file Bonaparte Colombo.

⁴ ASTO, Archivio Colonnetti Gustavo, Colombo to Colonnetti, 16 Dec 1943, 24 Jul 1944.

addition to being expelled from the scientific commission of the Italian Mathematical Union and from the editorial board of its «Bollettino» (Finzi 1994; Coen 2002). Thanks to the intermediation of Levi-Civita, he emigrated with his wife and five sons to Argentina in November 1939, shortly after Terracini, called to direct the newly created Instituto de Matematicas of the Faculty of Mathematical Sciences of the Universidad Nacional del Litoral (Cortés Pla 1962). He would remain in Rosario, near Santa Fé, until his death in August 1961, the only Italian mathematician who, despite being reintegrated, refused to return to homeland except for short stays.

Beniamino Segre, one of the last disciples of Corrado Segre and Francesco Severi, was also dismissed from the University of Bologna, and expelled from the scientific commission of the Italian Mathematical Union, from the team of collaborators of the «Enciclopedia Italiana» and from the editorial committees of the «Bollettino dell'UMI» and the «Annali di Matematica Pura ed Applicata». In January 1939 he applied to the Society for the Protection of Science and Learning (SPSL) for refugee status in either Belgium, Great Britain or the United States (Nossum 2012; Nossum & Kotulek 2015, Williams 2013). In a few weeks, a group of colleagues, coordinated by John Greenlees Semple and William Vallance Douglas, established a fund to enable Segre to flee. In the winter of 1938-39, after a stop in Turin to greet relatives and friends like Terracini, the Segres reached London and then moved to Cambridge. When Italy waged war on Great Britain, Segre was interned as foreign enemy, first at the Bury internment camp in Manchester, and later at the Palace internment camp in Douglas, on the Isle of Man, along with Enrico Volterra, son of the famous mathematician Vito Volterra. Released in August 1940, through the intervention of the SPSL and of the Royal Society, Segre received from Veblen a job offer for Princeton, but he preferred to remain in Manchester. Despite the fact that the period of exile was very productive for Segre, who for example published his famous volume *The Non-singular Cubic Surfaces: A New Method of Investigation with Special Reference to Questions of Reality* (Oxford, The Clarendon Press, 1942), in 1946 the Segre family returned to Italy, but Beniamino continued to maintain a web of relationships with his English friends (Beniamino Segre 1948).

Clearly Italian Jewish mathematicians who emigrated had very different professional and career paths in their new venues. For example, that of Fano was an industrious exile, spent collaborating with the Swiss agencies that tried to rescue Jews from the Nazis (Alessandro Terracini 1952), offering information on Italian refugees in Switzerland, teaching descriptive and analytic geometry in the Italian internment camps of Lausanne and

Huttwil, and holding lectures at the local Cercle Mathématique. On those occasions, and especially in the famous lecture entitled *Quelques aperçus sur le développement de la Géométrie algébrique en Italie pendant le dernier siècle* (4 and 11 May 1942) Fano celebrated the ‘glorious geometrical Risorgimento’ underlying the leading contributions of Segre’s Italian School of algebraic geometry.¹ The period of exile, however, represented a sort of parenthesis in Fano’s activity: he continued working on his favourite research themes and, as soon as possible, returned to Italy and took up the thread of his career where it had been interrupted.

In contrast, Fubini not only quickly adapted to the new setting (as Terracini wrote: «his gratitude to the country that welcomed him and his enthusiasm for the Western Hemisphere seemed to infuse new life»)² but he also managed to re-target his research activity, directing it towards new themes, including hyperautomorphic functions and ballistics, cultivated at the Institute for Advanced Study (Alessandro Terracini 1944, p. 28; The Institute for Advanced Study, «Bulletin» n.o 9, April 1940, p. 8).

For Terracini and Levi, the forced migration to Argentina, begun as exiles mourning the loss of their roots and national identity, turned into a true professional breakthrough. In fact, for both began «the stage of their life as organisers and sowers of ideas in a land that was virgin, but eager to produce».³ In particular, they promoted the work and the styles of the Schools of Peano and Segre to which they felt they belonged, and transplanted the best of Turin’s traditions of thought into the new milieu, leading to intriguing scenarios of cultural cross-fertilisation and circulation of knowledge.

For example, in his lectures on *Metodologia* delivered at the teacher training school (1939-41), Terracini illustrated Peano’s axioms for arithmetic, his symbolic language, the contributions of his School on the coherence and independence of axiomatic systems, and recapped the reflections of Peano, Padoa and Mario Pieri regarding the introduction

1 Biblioteca ‘G. Peano’ Torino, Fondo Gino Fano: manuscript of the lectures *Quelques aperçus sur le développement de la Géométrie algébrique en Italie pendant le dernier siècle*; *Les surfaces du quatrième ordre* (13 May 1943); *Les transformations de contact birationnelles dans le plan* (10 Feb 1944). The draft of the lecture *Les surfaces du quatrième ordre*, edited by Aldo Andreotti was published in «Rendiconti del Seminario Matematico dell’Università e del Politecnico di Torino» (12, 1953-54, pp. 301-313). The handwritten copy of a third lecture by Fano, *Les surfaces du troisième ordre* (13 May 1943) is lost. A short summary is included in Georges de Rham’s archive at the Epfl Library in Lausanne.

2 Terracini (1944), p. 28: «su gratitud hacia el país que le acogió y su entusiasmo por el Hemisferio occidental parecieron infundir nueva vida».

3 Santaló (1961), p. XXVII: «la etapa de su labor como organizador y sembrador de ideas en terreno virgen, pero ávido de producir». See also (Santaló 1968), (Herrera 2000).

into teaching and teacher training of some aspects of the research on logic and the foundations of mathematics. At the same time, however, he treasured the legacy of Segre's mentorship. Indeed, all the earliest lectures given by Terracini in Tucumán faithfully and almost literally follow the advice that Segre gave his students at the teacher training school.¹ Analogously, his lessons devoted to non-Euclidean geometry reprised the structure and even entire proofs of Segre's 1902-03 course on that topic.² Moreover, desiring to «communicate to a new environment the scientific tradition of the Old World»³ Terracini and Levi devoted themselves systematically – for the first time in their lives – to the dissemination of mathematics becoming true ambassadors of Italian schools of thought in South America. Such actions of cultural entrepreneurship diverge in a multiplicity of contexts, but the most emblematic one is perhaps the series of lectures devoted to bringing the voice of Italy to Argentina. Among such initiatives we can mention the series of lectures on mathematical logic delivered by Levi in Tucumán (Beppo Levi 1942a); the seminars on the origins of geometric concepts that Terracini offered in Rosario (Alessandro Terracini 1941), a repeat of those he had held in Turin in 1934-35, and the course in history of mathematics that Levi developed in Buenos Aires (Beppo Levi 1943). As far as concerns the *Correría en la logica matematica*, suffice to quote the following beautiful testimony by Terracini:

If I am permitted a personal recollection, I would like to add that those lectures by Levi bring to mind some pleasant days of 1942, lived in Tucumán as a dip –at that time and in that place – into the Italian intellectual world. Beppo Levi had come to Tucumán to give those lectures, and at the same time the friend Leone Lattes, professor of Forensic Medicine at the University of Pavia, then living in Buenos Aires, who I had invited on behalf of the Argentine Scientific Society to speak about blood groups, came to Tucumán. Also in Tucumán were

1 Compare Alessandro Terracini, *Metodologia Matematica*, 1939-40, pp. 49-57 with Corrado Segre, *Appunti relativi alle lezioni tenute per la Scuola di Magistero*, pp. 1-14, 42. The manuscript texts of Terracini's courses are kept in Biblioteca 'G. Peano' Torino, Fondo Alessandro Terracini, Quaderni 17-27. Segre's notebooks are digitalised and examined in (Giacardi 2013).

2 Compare Alessandro Terracini, *Metodologia Matematica*, 1939-40, pp. 87-141 with Corrado Segre, *Lezioni di geometria non euclidea, 1902-03*, pp. 3-22, 42-49, 70-72, 95-100. However, the same dual filiation could be appreciated also in other courses by Terracini («Quaderni» 17, 18), and in the lectures on epistemology given by Beppo Levi in Buenos Aires, at the Escuela Normal, in the years 1956, 1958 and 1960.

3 Laura Levi (2000), p. 60: «la posibilidad de comunicar a un nuevo ambiente la tradición científica del Viejo Mundo».

my brother Benvenuto and another friend of mine, Renato Treves, now a professor at the University of Milan. Really what we had constituted in those days was a little Italy.¹

A third level of inquiry, which deserves to be taken into consideration in order to fully appraise the impact of the racial laws, is the editorial one. In this connection, we should note that the *Bonifica libraria* mentioned earlier, in addition to prohibiting the use of texts by Jewish authors in all state schools, denied Jews any form of publishing contract whatsoever. This ban led to the need for Jewish intellectuals to renegotiate their position as authors, advisors and directors of publishing houses, as well as their roles in the editorial boards of local, national and international journals. Forced to find other vectors of promotion for their contributions, Terracini, Fano and Levi established new partnerships.

For example, in the last months he spent in Turin before leaving for Argentina, Terracini accepted the invitation to publish a textbook under a false name (*Algebra elementare ad uso dei licei*, Messina, Giuseppe Principato, 1940), and thus devoted himself, for the first time, to a research activity in mathematics education. The handbook bears the signature of Tricomi, and it is – so to speak – a unique piece in Terracini's production, because here he fully developed the theory of real numbers according to Dedekind's construction, respecting a demand for logical-deductive rigour that was foreign to the Segre School and that would seem to better reflect the rigorist approach typical of the Peanians.

It was the South American editorial world that benefited the most from the re-mobilisation of resources due to the racial purge in Italy, experiencing an unforeseen enrichment. In fact, aware that the level of scientific studies in Argentina could not be improved without adequate research facilities, Levi and Terracini personally managed a network of exchanges of book and journals with libraries in Europe and the United States. Still more important was the fact that they launched three new editorial ventures: the book series «Publicaciones del Instituto de Matematica» and two specialised journals: «Mathematicae Notae: Boletín del

¹ Alessandro Terracini (1963), p. 599: «Se mi è lecito inserire un ricordo personale, vorrei aggiungere che quelle conferenze di Levi mi rammentano alcune piacevoli giornate dell'autunno 1941 vissute a Tucumán come in un tuffo – in quel momento e in quel luogo – nel mondo intellettuale italiano. Erano venuti a Tucumán Beppo Levi per tenere quelle conferenze, e contemporaneamente l'amico Leone Lattes, professore di Medicina legale all'Università di Pavia, residente allora a Buenos Aires, che avevo invitato per conto della Società scientifica argentina a parlare dei gruppi sanguigni. Erano anche a Tucumán, come professori, mio fratello Benvenuto e l'altro amico Renato Treves, oggi professore all'Università di Milano. Era veramente una piccola Italia quella che avevamo costituita in quei giorni».

Instituto de Matematica» and «Revista de matematicas y fisica teorica». The book series, «Publicaciones», was founded by Levi in October 1939 and specially addressed to the prospective researchers attending the mathematical seminar in Rosario (such as Mischa Cotlar, Luis Santaló and José Babini). It hosted important contributions by Paul Montel, Julio Rey Pastor, and others, and represented a true novelty for the Argentinian scientific press. From September 1940 the volumes in the «Publicaciones» series were flanked by «Mathematicae Notae», which was also created by Levi and mainly dedicated to students and early-career scholars. In its pages appeared the lecture notes of some of the courses by Levi and Terracini mentioned earlier, emotional portraits of outstanding colleagues like Levi-Civita, whose passing had been ignored by the Fascist intellectual elite (Beppo Levi 1942b, pp. 155-159), and many reviews of text-books in mathematics and physics, written by Levi himself and by his daughter Laura, a professor of physics. Particular care was devoted to question-and-answer sessions and exercises, designed to create and consolidate a mixed readership, composed of professional mathematicians as well as amateurs and practitioners of mathematical sciences. The second periodical, the «Revista de matematicas y fisica teorica», was founded by Terracini in December 1940 in Tucumán. The editorial policy of the journal, the contacts with collaborators, even the correction of drafts, were entirely shouldered by Terracini, with the help of his whole family. The «Revista» gave many Italian Jews forced into silence by the racial laws, including Guido Ascoli, Gino Fano, Guido Fubini, Beniamino Segre and others, the opportunity to return to publishing their works. At the same time, the constant research for articles to be submitted to his journal led Terracini to build a network of international relationships much wider than the one he had had before exile. The partnerships that he established with scholars such as Albert Einstein, Élie Cartan and Veblen, would continue even after his return to Italy in 1948.

Through their editorial activities Terracini and Levi left a substantial and long-term legacy in both their native and adopted homelands. Levi, who remained in Rosario, renewed relationships with his Italian colleagues after the war, most of whom published in «Mathematicae Notae». Instead, Terracini came back to Turin, proud of «having performed his duty as a professor pretty well, and thus of having contributed to a favourable evaluation of Italian research in Argentina»,¹ but he main-

1 Alessandro Terracini (1968), p. 152: «avere compiuto abbastanza bene il mio dovere di professore, e di avere così contribuito a una favorevole valutazione del lavoro compiuto dagli italiani in Argentina».

tained his position as the virtual editor-in-chief of the «Revista de matematicas y fisica teorica» until his death in 1968.¹

5. Conclusion

Describing the Jewish presence in the Piedmont mathematical environment over as large a time span as the one we have chosen, proved to be a quite difficult task, both because of the risk of reducing the treatment to a medley of biographies and because the phrase «Jewish presence» conceals, in its indefiniteness, the truly problematic nature of the object of investigation. To speak in the singular means to assume that there was something unitary at the basis of the paths and the fates of Jews who, in connection with the University, the Politecnico and other schools of Turin, took part in the construction of the local and national cultural mi-lieu, as students, teachers, authors of textbooks, publishers, and philan-thropists.

In actual fact, by reconstructing the individual and collective stories of the Piedmont Jewish men and women of mathematics, in the delicate phase of transition from integration to assimilation, a trait of cultural contiguity emerged: their shared training, in the framework of the two famous research Schools in Turin directed by Segre and Peano. This realisation has contributed to illustrate, once again, the complete inconsistency of all the other canards fabricated by the racial campaign: the existence of a *Jüdische Mathematik*, antithetical to the Latin genius in mathematics (Severi 1935); the membership of the Turinese Jewry in a phantom Freemason-socialist coterie; their infiltrations and hyper-powerful lobbying in scientific institutions (Landra 1939), etc.

In relation to the way the racial purge was put into effect and its consequences, the Turinese milieu appears to form a quite paradigmatic case study. We have seen that the racial politics imposed by the Regime collided with the existence of a very consistent group, fully integrated and even unaware of a distinct identity and heritage. The purge acted as a push factor of change in this community, dramatically altering it and leaving a lasting mark, despite the repeal of racial legislation in 1944. At the university level too, the diaspora of Turin mathematicians can be surely framed within the phenomenon of Jewish intellectual migration,

¹ Oswald Veblen Papers (Library of Congress, Washington DC), Refugees, Terracini, Alessandro, 1938-43: Veblen to Terracini, 20 Nov 1939; Terracini to Veblen, 26 Jan 1943; Veblen to Terracini, 9 Feb 1943; Archives de l'Académie des Sciences de Paris, Fonds Cartan: Terracini to E. Cartan, 6 Jan 1946.

well documented in the literature (Siegmond-Schultze 2009; Barrow-Green *et alii* 2011; Capristo 2014). Nevertheless, it presents some distinctive features, starting from Terracini's and Levi's cultural commitment in Argentina, whose analysis has led to a reappraisal of the role and work of these scholars.

Abbreviations

ASTO: Archivio di Stato di Torino.

ASUT: Archivio storico dell'Università di Torino.

AET: Archivio delle Tradizioni e del Costume Ebraici Benvenuto e Alessandro Terracini.

ASPT: Archivio Storico Politecnico di Torino.

CDEC: Centro di documentazione ebraica contemporanea, Milano. EPFL: Bibliothèque de l'École Polytechnique Fédérale de Lausanne.

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