

# **Bruno de Finetti, Radical Probabilist. International Workshop**

Bologna 26-28 ottobre 2006

## **Some links between Bruno De Finetti and the University of Bologna**

**Fulvia de Finetti - Rome**

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Ladies and Gentleman, let me start thanking the organizing committee and especially Maria Carla Galavotti for the opportunity she has given me to open this International Workshop and talk about my father in front of such a qualified audience. This privilege does not derive from any special merit of my own but from the simple and may I say "casual" fact that my father was Bruno de Finetti.

By the way, this reminds me one of the many questions that the little Bruno raised to his mother:

"What if you married another daddy and daddy married another mammy? Would I be your son, or daddy's?" As far as the question concerns myself, my replay is that "I" would not be here to-day!

As I did in my speech in Trieste on July 20 2005, for the 20<sup>th</sup> anniversary of his death, I will try to show the links, between Bruno and Bologna in this case, Trieste last year. Sure, a big difference is the fact that he never lived in Bologna where he spent only few days of his life compared to the twenty and more years he spent in Trieste, yet it was in Bologna in 1928 that he moved the first step in the international academic world. I refer to his participation in the International Congress of Mathematicians held in Bologna in September (3-10) of that year.

It was again in Bologna in that same University that he returned fifty-five years later to receive one of the very last tributes to his academic career.

In the meantime, the big masters of the Italian mathematical school had disappeared and dramatic changes in the social and political life took place in Italy: years of war, of hate, not completely overcome even now, between Italians who had to decide in World War II for which Italy to fight.

### **The 1928 International Congress of Mathematicians**

I will first start explaining why that Congress was so important and not only for Bruno.

At that time, I mean after World War I, the scientific world of mathematicians, or if you prefer a more mathematical notation, the set of mathematicians divided itself in two subsets: mathematicians belonging to the winning countries and mathematicians belonging to the losing countries.

For this reason previous congresses failed in the achievement of a full international qualification. It has been a great merit of Salvatore Pincherle, one of the well known names in mathematics and president of UMI (Unione Matematica Italiana) and at that time also president of

the Mathematical International Union, to succeed in organizing that congress that, after many years of division, took place with the participation of winners and losers, the latter ones namely Germans, Austrians, Bulgarians and Hungarians. A long discussion arose in Germany on the opportunity to participate between the school of Berlin that was in favour and that of Göttinga that was against it. In the total of 836 participants, 76 were Germans, the biggest delegation, second only to the Italian one.

Bologna, the University of Bologna, the mother of all universities would hold the congress.

To overcome possible refusal of some countries to participate, the invitations came directly from Giuseppe Albini rector of the university, who used Latin language for his inaugural speech: "*Vobis omnibus, viri clarissimi...*"

Then Pincherle as president of the executive commission of the congress gave his speech in French and traced the story of the congresses from the very first one in Zurich in 1897.

In the afternoon, the congress appointed Salvatore Pincherle to be president, Ettore Bortolotti to be general secretary and Leonida Tonelli to be scientific secretary for the congress. Both had had Pincherle as professor.

The famous David Hilbert gave the first general conference; the other speakers in that first general session were Jacques Hadamard and Umberto Puppini. Umberto Puppini was a professor of hydraulics at the University of Bologna, who also had at that time important government role at both local and central level and a founder member of UMI.

In the following days in the morning general conferences were given by Emil Borel, Oswald Veblen, Guido Castelnuovo, William Henry Young, Vito Volterra, Hermann Weyl, Theodor von Karman, Leonida Tonelli, Luigi Amoroso, Maurice Fréchet, Roberto Marcolongo, Nicolas Lusin, and George Birkhoff. Let me mention the title of the conference given by Volterra *La teoria dei funzionali applicata ai fenomeni ereditari* and the one of Borel presented by somebody else *Le Calcul des probabilités et les sciences exactes*.

Due to the huge amount of communications that arrived, more than four hundred, the congress partitioned into seven sections: I *Analysis*, II *Geometry*, III *Mechanics*, IV *Actuarial*, V *Engineering*, VI *Elementary Mathematics*, VII *History of Mathematics*.

## **Bruno de Finetti**

Who was de Finetti at that time? He was a young man 22 years old with a brilliant degree in mathematics of the University of Milan dated 21 November 1927, who, at that time (1928), had produced six works: five concerning Mendelian heredity published in *Metron*, *Rendiconti Della R. Accademia dei Lincei* and *Rivista di Biologia*. Gumbel had reviewed the two works *Conservazione e diffusione dei caratteri mendeliani*; the other one *Probabilità che il massimo comune divisore di  $n$  numeri scelti ad arbitrio sia un numero dato* published in *Rendiconti Del R. Istituto Lombardo di Scienze e Lettere* reviewed by Sternberg. Both were German professors.

Bruno was working as head of the mathematical Service at Central Institute of Statistics in Rome. Was he completely unknown to the participants? No. Some of his professors of the University of Milan where he studied were there: Ugo Cassina who used "*Latino sine flexione*", the language devised by his master Giuseppe Peano, for his contribution, Umberto Cisotti elected president for one of the sessions, Bruno Finzi, Giulio Vivanti and Roberto Marcolongo who gave a conference in Milan on the new theories of Einstein when Bruno was a student there. He also advised Bruno to accept the job at Central Institute of Statistics. Some of the professors of the University of Rome that he met attending their seminars: Ugo Amaldi, Enrico Bompiani, Enrico Fermi, Giovanni Lampariello, Tullio Levi-Civita, Beniamino Segre were also there. Especially very well known he was to Guido Castelnuovo who often invited him at his home to see the progresses of his work. To him he sent the last version and Castelnuovo in a letter dated July 28, 1928 examines his work, recognizes his capabilities as analyst, gives advices on how to present the work and concludes, "*I feel sure that you will be able to give important contributions to Probability Calculus*

and its applications". Luigi Galvani who was his direct chief at Central Institute of Statistics, Corrado Gini the President of the Institute of course knew him very well.

### More on the participants

Looking at the list of participants you may find the names of three Nobel prizes: Niels Bohr who had received it in 1922, Enrico Fermi who will receive it in 1938 and Max Born in 1954, but none of them gave communication and reading the Proceedings of the Congress there is no evidence of their participation in the discussions.

You may also find the names of Oskar Morgenstern (1902-1976) and Johann von Neumann (1903-1957), only doctor at that time and not yet John, they too did not present any communication but there is evidence of their participation in the discussions in section IV-B and section I respectively. I signal this because my father in 1969 wrote the Preface to the Italian translation of *Spieltheorie und Wirtschaftswissenschaft* by Oskar Morgenstern for the type of Boringhieri and in 1970 *John von Neumann e Oskar Morgenstern* for the book *I maestri dell'economia moderna* for the type of Franco Angeli. Two articles *La teoria dei giochi* and *Riflessioni attuali sulla teoria dei giochi* appeared on *Civiltà delle Macchine* in 1963.

Another name that I have to report is that of George Polya who was president of one of the sessions in Section Analysis where he presented a communication, another one he presented in section Actuarial as we will see later on. Here I mention that, during the permanence of Polya in Rome sometime around 1972, he and Bruno prepared a documentary to teach mathematics in the school where there was an animated pupil who got the name of "Giorgetto" (Little George) after George Polya.

Let me add some more names for reasons that will become clear next hour: Jan Lukasiewicz (1878-1956), Karl Menger (1902-1985), Ernest Zermelo (1871-1953).

I do not think I am wrong saying that the entire Gotha of the scientific world was there and that no other congress of mathematicians, before or afterwards, ever attained such a qualified participation.

### Reading Volume I of the Proceedings

Volume I, the first of the six volumes that make up the Proceedings contains the list of the four hundred communications in the different sections and the general conferences. Volumes II to VI contain the communications. The names that I quote in the different sections are those that I found also in the Quaderno (copybook) where Bruno kept track of the works he sent them. It is rather interesting to be able to follow the changes in the address, most of the time not only the street changes or the city, but also the state and the continent.

The section on *Analysis* was still too much crowded and it was necessary to part it in four subsections; Giovanni Sansone, Waclaw Sierpinski, Octav Onicescu, Paul Levy, Harald Bohr, Giuseppe Vitali, Renato Caccioppoli, Francesco Tricomi, Leonida Tonelli, Richard Courant, Luigi Fantappiè, Salvatore Pincherle, Giovanni Giorgi, and George Polya presented contributions.

Berzolari opened section II on *Geometry* and announced the division in two subsections. Gino Fano, Francesco Severi, A. Rosenblatt, Beniamino Segre, Enrico Bompiani, Guido Fubini, Alessandro Terracini, E. Bortolotti, Pia Nalli, and Ferdinand Gonseth presented contributions.

The section on Mechanics divided in two subsections and George Birkhoff, Tullio Levi-Civita, Ferdinand Gonseth, Pietro Burgatti, Jacques Hadamard, Bohuslav Hostinsky, A. Rosenblatt, Mauro Picone and Giovanni Giorgi gave contributions.

Ugo Amaldi opened section six devoted to *Elementary Mathematics* with the new of the absence of Giuseppe Peano, caused by the death of his brother. One session in the following days was

completely devoted to the teaching of Mathematics: Castelnuovo gave a complete report of the meetings of the International Commission established in 1908 in the International Congress of Mathematicians held in Rome. Some of the components of the Commission died, one was Emanuel Czuber the author of the book on Probability, the first on the subject that my father read.

I skipped section IV Actuarial only because we are going to examine day by day what happened in that section where on Saturday September 8, after the lunch offered by the prefect of the province of Bologna, Bruno gave his communication: *Funzione caratteristica di un fenomeno aleatorio* and was able to capture the attention of some of the big names in mathematics.

### **Section IV (Actuarial)**

Corrado Gini opened the works on Tuesday afternoon. After welcoming the foreign participants, he communicates that due to the excessive number of works presented, the section will divide in two subsections section: IV-A devoted to *Mathematical Statistics and Probability*, section IV-B devoted to *Mathematical Economy and Actuarial Sciences*. He also pointed out the difference between the extraordinary amounts of works received compared to the few works presented at the Congress held in Rome twenty years before.

For subsection B *Mathematical Economy and Actuarial Sciences*, I will mention only one of the presidents Guido Toja, who was president on Tuesday when Gumbel and Ronald Aylmer Fisher gave their communications. Unfortunately, Fisher's presentation *The principle of synthetic induction in the estimate of subjective a priori probability* is not in the Proceedings of the Congress. In the Proceedings, one may find Fisher's contribution in section IV A the one presented by Galvani as secretary of the sessions. In addition, there is no evidence of his participation in the discussions, so this may explain the fact that Bruno and Fisher did not have any correspondence as far as I know and only in 1942 Bruno started to send him his works. Another problem was due to the language, only in 1948, Fisher's work became available in Italian and my father started to study English only in 1950 for his tour in U.S.A. sponsored by Fulbright.

The mention of Guido Toja is because Bruno less than two years after Bologna will win a prize entitled to his name.

Now it is on section IV-A the one devoted to *Mathematical Statistics and Probability* that I will concentrate your attention.

On Tuesday, Cantelli was the president; five were the communications and many names in the discussion.

On Wednesday Francesco Cantelli gave his presentation *Sui confini della probabilità*, Picone and Polya raised comments, then Hostinsky gave his presentation and then Polya whose communication raised comments by Neyman, Fréchet and Lévy. More communications followed and then Jerzy Neyman posed the problem to have a restricted set of academic journals entitled to host research works in probability so to make possible to keep pace with the progresses of this important field of science. Cantelli explains that it is possible to create a Bulletin devoted to Probability, but Neyman suggests to use immediately "Rendiconti del Circolo Matematico" di Palermo or "Metron" both well known and largely diffused journals. Gumbel proposes to create a Commission to explore these possibilities.

On Saturday, the appointed president for the day Fréchet, engaged in another section, George Darmon became President. After the communications of Galvani and Gruzewski, he invites Neyman to read the proposal of the Commission concerning the publication of papers on Theory of Probability: "To facilitate that concentration in its natural way the Section IV-A asks the Committee to publish in *Rendiconti del Circolo Matematico di Palermo* the statistics of papers under consideration and to indicate how many of these appear in different journals. That statistics will concern papers mentioned in (2) last volumes of *Jahrbuch der Fortschritte in der Mathematik*".

Section IV-A approved the proposal. The same commission proposed a second wish for the formation of an International Committee for the progress of Probability calculus and its applications, with the aim to form an International Society similar to "Circolo Matematico di

Palermo" that will produce a Bulletin with sufficiently long summaries of all the papers appeared in all different languages on the subject. Section IV-A approves also this second proposal and the President invites those interested to be in the Committee to give name and address.

Twenty-one names and addresses follow, the order is not alphabetic nor by country, so do I presume it the order in which people gave their names:

- F.M. Urban (Brno, Czecho-Slovakia)
- Octav Onicescu (Bucarest)
- Emil Julius Gumbel (Heidelberg)
- Carlo Alberto Dell'Agnola (R. Istituto Superiore di Scienze economiche e commerciali, Venezia)
- Bruno de Finetti (Istituto Centrale di Statistica, Roma)
- S.D. Wicksell (University, Lund, Sweden)
- E. C. Molina (195 Broadway, New York)
- George Darmois (8, Rue du Hout Bourgeois, Nancy)
- Eugene Slutsky (Nikitsky Boulevard 12/18, Moscou, 19)
- Francesco Paolo Cantelli (via Merulana 105, Roma)
- Aleksandr Yakovlevich Khintchine (I Université, Institut Mathématique, Moscou)
- L.Gustave Du Pasquier (Sablons, 88 Neuchatel, Switzerland)
- Jerzy Neyman (Institut Mathématique de l'Université N. Swint, 72, Varsovie)
- Antoni Lomnicki (Politechniki, Lwów, Poland)
- Gruzewski (Ecole Sup. de Commerce, Varsovie)
- Corrado Gini (Istituto di Statistica e Politica Economica R. Università, via delle Terme di Diocleziano, 16, Roma)
- C. Jordan (28 Szerbutca, Budapest)
- G. Pietra (R. Università, Padova)
- K.G. Hagstrom (Livfovsakringsbolaget, Frambinden, Stockholm)
- Y. Miura (Chuo, Central University of Tokio, Kanda)
- V. Korinek (Haute école Technique Karlownam, Prague II)

Fréchet took again the Presidency to let Darmois give his contribution that caused comments by Cantelli, Fréchet and others also the next contribution caused comments by Cantelli and Gumbel. At this point another change in the Presidency, Fréchet goes away and Gini is President. What follows is the last part of the very last session: To-morrow people will leave Bologna because the closing session will take place in Florence. Therefore, it is in this ending atmosphere that the last four presentations took place, the last but one was that of de Finetti. No comments on the last four and so the works closed at 7.45 p.m.

This is the end of the chronicle of section IV-A. I believe that what happened that day, I mean the creation of an International Committee for the progress of Probability calculus and its applications, was really important for Probability as a Science. Those people who gave their names recognized Probability as an important field of research and marked the birth of a new branch within Mathematics. It is always difficult to establish a date, of course the subject was not new but now it acquired a dignity in its own, so this is the reason why I choose September 8<sup>th</sup> 1928 for such a date. Of course I recognize I am using a very subjectivist point of view, that in my case must have something to do with the DNA.

Now a few comments on the list. Fourteen of these names appear in the second part of the *Quaderno* (copybook) that I already mentioned.

I have prepared some biographical information for those in the list who had some similarity with the biography of de Finetti or with his fields of interest, adding, when appropriate, some details on their relationship with him, also to show with whom he had to measure himself.

### **Corrado Gini (1884-1965)**

He was an Italian statistician and economist. He studied law but followed also lessons on mathematics. He became Director of ISTAT in 1926 and created in 1927 the "Istituto Centrale di Statistica", becoming the first President. He enormously influenced the development of Italian statistics both scientific and political and for a long time he represented the Italian statistical school.

He also had an enormous influence on my father life and career: in 1926, he published on *Metron*, the journal he founded in 1920, the very first work of my father and offered him an employment as soon as he finished his studies. At that moment, my father was still a student at the Polytechnic and this offer of an employment convinced my grandmother to let Bruno move to University to study Mathematics. When in Rome he had the possibility to meet the important professors that worked there and the names were those of Guido Castelnuovo, Federico Enriques, Enrico Fermi, Mauro Picone, Octav Onicescu only to name a few. Due to the contiguity of his work place after work, he used to join the seminars that took place in Panisperna Street and particularly impressed he was by Enrico Fermi whose rapid career became a target for himself. Also in Rome, he met Renata his future wife and my future mother. A big influence indeed!

Probably he also influenced the decision of my father to leave the Central Institute of Statistics to join Assicurazioni Generali in Trieste. The letter of my father to Assicurazioni Generali is dated 1929 and in 1929 Gini published *Di una applicazione del metodo rappresentativo all'ultimo censimento italiano della popolazione* in "Annali di Statistica". In a letter dated April 15, 1929, Bruno writes to his mother that the volume *Annali di Statistica* contains the first work he did for the Institute and particularly the two Appendices, the most difficult part of the work, were completely his own, but the names were only those of Gini and Galvani! For this or some other reason, Bruno left the Institute at the end of his three years contract in 1931.

### **Francesco Paolo Cantelli (1875 - 1966)**

He was born in Palermo, finishes his studies in mathematics at University of Palermo in 1899. At the beginning, he worked in astronomy and through the information present in *Divina Commedia* he demonstrated that the imaginary journey of Dante took place in 1301. Then for twenty years he worked as actuary at the "Istituto di Previdenza della Cassa Depositi e Prestiti". In 1923, he wins the chair for *Matematica finanziaria e attuariale* in Catania and in 1931 goes to Rome on the same chair that he will keep until 1951 when he retires. He will die in Rome. He gave contributions to probability and financial and actuarial mathematic. He created in 1929 the "Giornale dell'Istituto Italiano degli Attuari" that he directed up to 1958. On this journal, Bruno published several works. He was elected member of the Accademia dei Lincei in 1947.

The different view on probability between Cantelli and Bruno caused some trouble to my father at the time he decided to move to Rome University and for his election as member of the Accademia dei Lincei. My father became a member of the Accademia only in 1974.

### **Octav Onicescu (1892 - 1983)**

He was a mathematician, founder of the Romanian school of probability theory, founder of the statistic school. Octav Onicescu is the first Romanian with the doctorate in mathematics in Rome, with the qualification "magna cum laude" in front of a commission of eleven university professors, chaired by Levi-Civita.

He received two Rockefeller fellowships the first in 1924 the second in 1933.

Bruno and Onicescu for this reason had the chance to meet already in Rome and later in 1937 they met in Geneva. Their long friendly acquaintance permitted to my father to publish one of his many works on probability written in 1968 *Sul ruolo concettuale delle <<considerazioni asintotiche>> nella teoria delle probabilità* in the book that Onicescu published in 1969 in Italian *Calcolo delle probabilità e applicazioni* and also decided my father to contribute with two very small papers to the book *Papers in honour of Octav Onicescu* in occasion of his 90<sup>th</sup> birthday in 1982.

I had the possibility to meet him and his wife on two occasions, the first one in Rome in 1965 and the second one in Bucharest in September 1971 for the Congress on Logic, Methodology and Philosophy of Science.

That Congress was also the last chance for my father to meet his dearest friend Jimmie Savage, who was there as invited lecturer. The title of his conference was *Probability in Science: A Personalistic Account*. The sudden news of his death came as a shock for my father who lost the only person able to understand his view on probability and to adhere to it and ended a twenty years long and fruitful correspondence. Much I could say about their deep consonance, but this would take us far from Bologna!

### **Emil Julius Gumbel (1891 - 1966)**

He was a German statistician, born in Monaco. Like many others Europeans due to political reasons, he will migrate to United States in 1940. He met Bruno in Geneva in 1937 for the Colloquium on probability. He died in New York City. He reviewed for Zentralblatt some works of de Finetti.

### **George Darmais (1888 - 1960)**

In April 1929, he wrote a letter to my father to thank him for sending his work "Sulle probabilità numerabili e geometriche" and to inform him that in March he exposed in the Seminary the works of Bruno on Mendelian characters. He also mentions that Hadamard told him that Bruno would be in Paris next year and that he attended the lessons of Fermi at the Institute Henri Poincaré and adds a very kind comment on the vitality of the Italian scientific research.

### **Carlo Alberto Dell'Agnola (1871-1956)**

In 1926 became professor of Matematica Finanziaria in the Faculty of Economia e Commercio di Venezia (Cà Foscari).

### **Aleksandr Yakovlevich Khintchine (1894-1959).**

Khinchin's father was an engineer. Khinchin attended the technical high school in Moscow where he became fascinated by mathematics. However, mathematics was certainly not his only interest when he was at secondary school for he also had a passionate love of poetry and of the theatre. He completed his secondary education in 1911 and entered the Faculty of Physics and Mathematics of Moscow University in that year.

At university in Moscow Khinchin was an outstanding student, he wrote his first paper in 1916, before graduating. After graduating in 1916, Khinchin remained at Moscow University undertaking research for his dissertation that would allow him to become a university teacher.

Around 1922 Khinchin took up new mathematical interests when he began to study probability.

In 1927, Khinchin became professor at Moscow University and, in the same year, he published *Basic laws of probability theory*.

### **Antoni Lomnicki (1881-1941)**

He was a Polish mathematician. He became professor in 1920. The Germans murdered him during the Second World War.

### **C. Jordan (1871 - 1959)**

He was the pioneer in Hungary of probability theory and statistics.

### **Eugene Slutsky (1880-1948)**

Eugene (or Eugen or Yevgeni) Slutsky intended to become a mathematician, but he was expelled from the University of Kiev for participating in student revolts. He got a doctorate in law in the end and then began to teach at the Kiev Institute of Commerce. This was in 1911. He published his first economics paper in 1915, in Italy in "Giornale degli Economisti". His other prominent contribution to economics came in 1927. The rest of his work, much of it accomplished after his move to Moscow in 1920, was in probability theory.

### **Gaetano Pietra (1879-1961)**

He was professor of Statistics at the University of Padua. He became Senator for Demo Christian party in 1948-53.

### **Jerzy Neyman (1894-1981)**

I will spend now some more words on Jerzy Neyman biography for two reasons. The first one is that he was one of the three names; the other ones were Castelnuovo and Frechét that, beside Jimmy Savage, my father mentioned in his often-remembered Farewell Lesson. They gave him the possibility to explain his ideas in important occasions even when in contrast with their own ideas and this he particularly appreciated. The second reason is some kind of analogies in the biography of the two.

Jerzy was born into a Roman Catholic family, which considered it Polish and was certainly Polish speaking, but at the time, officially Poland did not exist as a separate country.

Neyman wrote papers for a few years under the name Splawa-Neyman, the first part was a sign of nobility.

As a young boy, Jerzy lived in several different towns: Up to the age of ten, a governess taught him at home and then he entered the local gymnasium. Remarkably, he could speak five languages by this time, Polish, Ukrainian, Russian, French and German. In 1906, however, his father died and his mother, now having little money to bring up her son, moved to Kharkov where she had relatives. Neyman excelled at the gymnasium at Kharkov and he decided that he would study mathematics at university. Between completing his schooling and entering university, he made a European train journey through Austria and Italy.

Neyman began his studies at Kharkov University in the autumn of 1912. He was interested both in physics and in mathematics. Many students left for military service when World War I started in 1914 but Neyman failed the eyesight test so remained at University. He wrote a paper in



1915. In the academic year 1915-16 Aleksandr Bernstein lectured to him on probability; he strongly influenced Neyman

In September 1917, having completed his studies, Neyman remained at Kharkov University preparing for an academic career and began to take an interest in statistical ideas. However, the last year of the war, the Russian Revolution, and the civil war, totally disrupted the academic life of the University. Neyman's health began to deteriorate. The doctors diagnosed tuberculosis. Poland and Russia were at war and Neyman was imprisoned and held for about six weeks.

Despite the difficulties that he was under, Neyman passed his examinations and became a lecturer at Kharkov University. In 1921, he went to Poland and made contact with Sierpinski. To earn some money he took a job as senior statistical assistant at the Agricultural Institute in Bromberg. Keen to be in Warsaw, in December 1922 he took a job in the State Meteorological Institute there. He began to write papers on applications of statistics. He became an assistant at Warsaw University at the beginning of the academic year 1923-24. He received a doctorate in 1924 for a thesis on application of probability to agricultural experimentation. He received a Rockefeller Fellowship to work in London, where he arrived in September 1925.

Neyman obtained an extension of his fellowship to allow him to spend a year in Paris. He arrived in Paris in the summer of 1926 to visit Borel.

Neyman returned to Poland in May 1927 and immediately tried to set up a biometric laboratory in Warsaw. He spent time in both Warsaw and Krakow, on 26 June obtained his habilitation, and began lecturing as a docent and in 1928 he set up a Biometric Laboratory at the Institute for Experimental Biology in Warsaw.

Neyman obtained a three-month leave of absence to go in England in 1934 and held it until 1938.

Although Fisher had inspired much of Neyman's work, now that they were working in the same building relations seemed to break down. In the spring of 1937, Neyman spent six weeks in the United States on a lecture tour of universities. Shortly after his return Neyman received an offer of a lectureship at the University of California at Berkeley.

In 1937, he was in Geneva and met again Bruno. In fact in that famous Colloquium some of the participants in Bologna namely Frechét, Hostinski, Lévy, Onicescu, Polya had a new opportunity to discuss their different point of view about probability.

On April 1938, Neyman accepted the offer from Berkeley and worked in Berkeley for the rest of his life. There he taught probability and statistics in the mathematics department.

After 1945, Neyman, director of the Statistical Laboratory, organized the Berkeley Symposia on Mathematical Statistics and Probability. These occurred at five-year intervals and gathered for a period of six weeks a large number of eminent scholars.

In 1950, Bruno visited United States for three months, for the occasion he studied English and attended the second Berkley Symposium. Neyman received him with great friendship and in that occasion, he encountered Jimmy Leonard Savage who immediately invited him in Chicago. In 1951, Neyman wrote to de Finetti surprised not to find his name among the members of the International Statistical Institute. Immediately promoted his membership only asking Bruno to find one Italian member to sustain his membership because usually at least one of the sustainers was of the same country of the candidate. Anyhow, he would go on with the proposal. That is how Bruno became a member of ISI. In 1957, he became also a member of Istituto Centrale di Statistica.

In a note of *La scienza e la lotta contro l'incertezza* published in 1962 Bruno invites the reader to read Neyman's *Indeterminism in science and new demands on statisticians* using the words "masterly exposition".

In the note immediately following this one, there is the mention of two works of R.A. Fisher on the subject of how to project and analyze experiments, a subject according to de Finetti's note "*Fisher gave the greatest impulse, despite some conceptual imperfection partly corrected by Neyman and Egon Pearson and partly by the subjectivistic school...*"

Let me spend a few words to remember the already mentioned meeting in Geneva in 1937, the famous Colloquium on Probability, that may be considered as the first meeting of the Committee. Among the participants we find de Finetti, Gumbel, Neyman, Onicescu, these are the ones that appeared in the list; Paul Levy, Heinz Hopf, Doebelin Hostinsky, George Polya and Maurice Fréchet, these are the ones that were also in Bologna; but many new entries in the field were there, for a very well documented discussion of their positions about probability; let me remark that the merit for that documentation goes to my father.

### **Some consequences of the Congress**

I will now try to enumerate the many opportunities that Bruno got from his participation at that congress.

The work presented by de Finetti during the Congress with some additions will be published in "Rendiconti della R. Accademia dei Lincei" sponsored by Castelnuovo and Levi Civita and this was just the first of a set of works of de Finetti that Castelnuovo presented at the Accademia dei Lincei, the last one in 1933, when de Finetti had already left Rome. Castelnuovo was also president of the commission for Toja award won by de Finetti in 1930 and member in the commission for Milan Insurance award, president in that occasion was Tullio Levi-Civita, won by de Finetti in 1934.

Three months after that Congress he became a member of the "Circolo Matematico di Palermo", the famous international institution born in 1884.

In 1929 and 1930, Giovanni Giorgi presents seven notes of de Finetti at the "Pontificia Accademia delle Scienze Nuovi Lincei".

In addition, he surely captured the attention of Sierpinski, one of the founder of the famous journal "Fundamenta Mathematicae" who in 1931 will publish Bruno's work *Sul significato soggettivo della probabilità*. It is interesting to note that Sierpinski has been also editorial board member for "Rendiconti del Circolo Matematico di Palermo".

To testimony in his own words how important it has been for him to get himself known during that congress let me translate a passage of a letter he wrote to his mother a few months later: *"Today Vivanti wrote me a letter to inform that he received from Hadamard a very flattering declaration concerning me [...]Would you believe that Hadamard knew perfectly my works on Mendelian laws and that he gave them to Professor Darmois to be studied in his Mathematical Seminary in Paris[...]Then Vivanti transcribes for me this passage of Hadamard that I copy for you: C'est vous dire que je suis tout coinvaincu de sa valeur. Je serai tres heureux de le voir avec nous a Paris"*.

This possibility was in connection with a Rockefeller fellowship that he would have liked to have when he was a student but his professor Vivanti advised him that it would have been easier to get the fellowship when graduated. So immediately after graduation, he started the necessary procedures. The difficulty now was his job that he could keep for an absence of six months at maximum and beside that, they judged him too young. It will be only on May 1935 that he will go to Paris, this time invited to give a set of conferences at the Institute Poincaré.

After this long excursus on the 1928 Congress of Mathematicians, I come briefly to the second event that brought Bruno in Bologna and that, as we will see, was another consequence of the first event.

### **The Honorary Presidency of AMASES**

The 5<sup>th</sup> of November 1983 the University of Bologna hosted some one hundred and fifty professors from various universities for the ceremony organized by AMASES the Italian Applied Mathematics Association to Economic and Social Sciences jointly with a Committee especially constituted to homage de Finetti as Honorary President of the Association.

The ceremony took place in the historical Chancellery that hosted the congress where Bruno for the first time in an International Mathematics Conference gave his important contribution. Professor Rizzoli the rector of the University in his opening speech explained the reason for this choice. The official speakers as one may easily imagine used words of appreciation for his scientific merits and for his dedication to Education and Culture that I do not want to repeat and that caused great emotion to my father. Less than two years later, he left us.

This might have been also the end of my speech but de Finetti decided to give Bologna a new gift the presentation of a monograph that turns us back to 1934 and probably keeps some remembrance of ideas heard here in 1928 during the general sessions of the congress that, knowing my father as I do, he surely attended from the first to the last minute with great attention.

Thank you for Your attention.