

The first President of the IAU, Benjamin Baillaud

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Abstract. Benjamin Baillaud was appointed president of the First Executive Committee of the International Astronomical Union which met in Brussels during the Constitutive Assembly of the International Research Council (IRC) on July 28th, 1919. He served in this position until 1922, at the time of the First General Assembly of the IAU which took place in Rome, May 2–10. At that time, Baillaud was director of the Paris Observatory. He had previously been director of the Toulouse Observatory for a period of 30 years and Dean of the School of Sciences of the University of Toulouse. He specialized in celestial mechanics and he was a strong supporter of the “*Carte du Ciel*” project; he was elected chairman of the permanent international committee of the *Carte du Ciel* in 1909. He also was the founding president of the *Bureau International de l’Heure* (BIH) and he was directly involved in the coordination of the ephemerides at an international level. In this paper, we present some of his activities, particularly those concerning international programmes, for which he received international recognition and which eventually led to his election in 1919 to the position of first president of the IAU. We also briefly recount the very first meetings and years of the IAU.

Keywords. *Carte du Ciel*, ephemerides, Bureau International de l’Heure, BIH, International Research Council, IRC, Toulouse Observatory, Paris Observatory, Pic du Midi, International Astronomical Union, IAU statutes

1. Life and academic career

On the one hand, Benjamin Baillaud’s life may appear like “*un long fleuve tranquille*” as the film title (Chatiliez 1988) has it (a long quiet river) which in a way culminated with the highest international recognition when he was elected in 1919 as the first president of the newly created International Astronomical Union. On the other hand, his academic carrier turns out to be extremely rich, concerning a large variety of initiatives which have had long-lasting impacts – some even to this day. The Toulouse period is particularly illuminating; a few examples will be briefly presented in this paper. However, Baillaud’s career is not marked by major discoveries. He has been somewhat forgotten: when hearing the name “Baillaud”, present-day astronomers refer more frequently to Benjamin’s sons who became astronomers, René Baillaud and Jules Baillaud. Both also had an impact on French astronomy and are closer in time. Many aspects of Benjamin Baillaud’s work were unglamorous and thankless. He often had to build from scratch. Still the success of his accomplishments, his ability to manage important national and international projects, resulted in his international recognition.

Benjamin Baillaud was born on February 14, 1848, in Chalon-sur-Saône in the heart of French Burgundy. His father was an employee at the city’s Town Hall. Benjamin was eligible for scholarships based on his academic performance. He proved to be a brilliant pupil and entered the *École Normale Supérieure*, rue d’Ulm in Paris, in 1866,

at the age of 18 (Fig. 1). This already was the most prestigious school for teachers and university professors. He specialized in mathematics. This is a time when he created lifelong friendships and links with colleagues, some of whom were to play important roles in the future. Three years later, at the age of 21, he earned the degree of Associate Professor (or *normalien agrégé*) in mathematics.

Thereafter he had to fulfil a ten-year commitment to teaching. He was sent to Toulouse, then Montauban, where he was during the fall of the French Second Empire. This was the occasion for him to express his strongly republican commitment. During the following years, Benjamin Baillaud was appointed to various *Lycées* in Paris, then at the Paris Observatory where he soon became an assistant astronomer. He defended his PhD thesis on the perturbations of the motions of comets and was highly appreciated by the director of the observatory, Urbain Le Verrier, who, on occasions, asked Baillaud to replace him for teaching at the Sorbonne.



Figure 1. Benjamin Baillaud (age 20) at the *École Normale Supérieure*, from a photo courtesy the Bouty family.

In 1878, at the age of 30, Benjamin was sent to Toulouse to teach astronomy at the university and to direct the observatory. He was formally appointed the following year and was to stay in Toulouse for a period of 30 years, which will be briefly described in the following section (Fig. 2).

In 1908, at the age of 60, Benjamin Baillaud was elected as a member of the French Academy of Sciences and Director of the Paris Observatory (Fig. 3). He would keep the latter position for 18 years, until 1926, when he retired at the age of 78. This is the period when he was elected President of the IAU (1919–1922). He then retired to Toulouse, where he died on July 8, 1934 at the age of 86.

It is noteworthy that throughout his career, he pursued his mathematical research, and published on positional astronomy and celestial mechanics, on the theory of perturbations and mechanical quadratures, in particular.

2. The making of a president

Until he became president of the IAU in 1919, Benjamin Baillaud, following his ten-year commitment mostly spent at the Paris Observatory as assistant astronomer, had a 30-year experience in Toulouse (1878–1908) with key administrative and scientific responsibilities in higher education and research, and a 10-year experience as director of Paris Observatory (since 1908, see Fig. 3).

A short time after he arrived in Toulouse, in 1879, he was appointed Director of the Observatory and the rector of the Academy nominated him Dean of the School of Sciences. Baillaud was 31 and his youngest colleague at the faculty was 57! Right away, he recruited high level young academics; one of the first was Émile Picard (23) who was



Figure 2. Pater familias: Benjamin Baillaud and his family in Toulouse circa 1898 (Benjamin is 50). From left to right, front: Madeleine (first twins), H el ene and H el ene (mother and daughter), Marthe; rear: Pierre (second twins), Henri (first twins),  myle, Benjamin, Jules and Ren  (second twins). Photo courtesy Lucien Baillaud († 2018).

later to become the permanent secretary of the Academy of Sciences, and was to play an important role in the foundation of the International Research Council that led to the creation of the IAU. Other young, successful, academics he recruited include Marcel Brilloin, Aim  Cotton, Paul Sabatier (future Nobel laureate who gave his name to one of the universities in Toulouse), and several others.

This definitely had long-lasting effects on the appreciation and position of the university. He also renewed buildings and equipment. Similarly, he modernized the buildings and equipment of the Toulouse Observatory, making it over the years the leading French provincial observatory, in association with the astronomical station at the Pic du Midi that he founded. It is interesting to note that, a short time after his arrival in Toulouse, Baillaud was confronted with various difficulties implying politics, religion, bribes; he always reacted very promptly with the full integrity, independence and neutrality which is expected from a public servant. He was strongly republican (this was the time of the French Third Republic) and was faithful to the principle of secularism, years (decades!) before the French law on the Separation of the Churches and the State was passed (in 1905).

But what made Benjamin Baillaud a potential presidential candidate for the IAU is certainly the fact that he was, from early on, an internationalist, on both scientific aspects and management aspects: Baillaud always was intimately convinced of the value of international cooperation. In what follows, we give four examples: the *Carte du Ciel*, the *International Solar Union*, the *Ephemerides*, and the *Bureau International de l'Heure*.

2.1. *The Carte du Ciel and the astrometric catalogue (1887)*

This very ambitious project was launched by Admiral Mouchez, director of the Paris Observatory, during a congress that took place at the observatory on April 16–27, 1887. Fifty-six delegates from 16 different countries were captured on a memorable photograph by Nadar. This indeed was the beginning of photography as a scientific tool, and the plan was to map the entire sky down to the 15th magnitude, corresponding to 20–25 millions



Figure 3. Benjamin Baillaud in 1916 (at 68). Painting by André Rixens (1846–1925), a friend of the Privats, Benjamin Baillaud’s daughters and sons-in-law (Private collection). Courtesy of Cécile and François Lionnet, great-great-grandchildren of Benjamin Baillaud. ©Lionnet.

of stars. Ten observatories in the northern hemisphere and eight in the southern were to finalize the project by the turn of the century! This was taken by Benjamin Baillaud, who attended this founding meeting (he was 39), as a strong stimulant for the development of the Toulouse Observatory, which was thereafter mostly devoted to the *Carte du Ciel*. Other international congresses took place in 1889, 1891, 1896, 1900 and 1906, all of which Baillaud attended. His commitment, success and notoriety were very well established and during the International Conference that took place at the Paris Observatory in April 1909, he was unanimously elected chairman of the permanent international committee of the *Carte du Ciel*.

2.2. *The International Solar Union (1904)*

The *International Union for the Cooperation in Solar Research* was created by George Ellery Hale, of Mount Wilson Observatory, in St Louis in 1904. Other meetings followed: 1905 in Oxford, 1907 in Paris, Mount Wilson in 1910, and the last meeting in Bonn, in 1913. That was the time of the first developments of astrophysics, when solar physics played a major role. Baillaud certainly followed closely the results obtained at the Meudon Observatory where solar spectroscopy was being developed.

Interestingly, four future presidents of the IAU attended the Bonn meeting, in 1913: Benjamin Baillaud, the first president, William Wallace Campbell, second president, Frank Dyson, fourth president, and Arthur Edington, seventh president (1938–1944).

2.3. *The International Congress of Astronomical Ephemerides (1911)*

The calculation of astronomical ephemerides certainly represents a subject of choice for Benjamin Baillaud, a mathematician well engaged in international cooperation. Computation of the ephemerides were divided among five principal almanac offices in five different countries. After his return to Paris, in 1908, Baillaud got to work more closely with the *Bureau des Longitudes*. In October 1911, he convened and led an international conference that took place at the observatory. He was directly at the origin of several proposals that would be put progressively into practice: the standardization of the calculations and their publication in unified form; the mutual exchange of fundamental ephemerides; the recommendation that the calculation of fundamental ephemerides (high-precision positions of the Sun, Moon, and planets) and of eclipses be calculated independently at two locations. The agreement also concerned minor planets and variable stars.

2.4. *The Bureau International de l'Heure (BIH) (1912)*

In May 1908, the *Bureau des Longitudes* started a project to broadcast time signals provided by the Paris Observatory from the *Tour Eiffel*. Benjamin Baillaud, who had just arrived in Paris, was leading the project and collaborated with (future) General Gustave Ferrié, who took care of the broadcasting. The first signals were actually sent in May 1910. In October 1912, a first international conference on time was held at the observatory and it was decided to establish a permanent Commission and Bureau in Paris (the BIH), that would coordinate results, verify and broadcast UT. During the second international conference on time, held in October 1913, again at the observatory, the international committee asked Baillaud to implement the BIH. However, the BIH official creation could not be ratified before the war, and Benjamin Baillaud unofficially assumed the effective management and operation of the BIH from 1912 through to 1919. He even implemented a backup site in Lyon, connected with a local radio broadcasting station, in case the Paris site would have to be discontinued.

Baillaud also got international recognition in 1909 with the final discredit of the Martian canals theory brought by outstanding photos taken at the new Baillaud dome at the Pic du Midi astronomy station.

3. The birth of the IAU

There has actually been a lot of upstream work, well before the end of the war. In 1916, the President of the United States, Woodrow Wilson, constituted the *National Research Council* which had to secure the cooperation of all institutions and agencies in the US (education and research, industry and engineering, Army and Navy, Government, etc), in preparation for possible involvement in the war. The Foreign Secretary of the US National Academy, George Ellery Hale, became the chairman of the NRC ([Wright et al. 1972](#)). (He is the one who created the *International Solar Union*, mentioned in the previous paragraph.) Hale, who was a true internationalist, was to be a key figure, a key architect for the organization of post-war science. “*The NRC formed the starting point for Hale’s efforts toward the creation of the International Research Council (IRC) from which, eventually, the IAU would emanate*” ([Blaauw 1994](#)).

Indeed, after the US entered war in April 1917, and particularly from April 1918, Hale contacted leading scientific bodies in Europe: the French Academy of Sciences, whose permanent secretary was Émile Picard (the one whom Baillaud had recruited in Toulouse in 1879 at age 23), and the Royal Society, whose Secretary was Arthur Schuster. A meeting was held in London on October 9–12, 1918: the first *Inter-Allied Conference on*

the Future of International Organization in Science (supposedly where Baillaud insisted to use the word “Union” rather than any other term), followed by a second meeting in Paris on November 26–29, 1918, where the name IRC was coined. Everything was set to prepare the Constitutive Assembly of the *International Research Council* that took place in Brussels on July 18–28, 1919.

The IRC executive committee comprised Émile Picard as President, Arthur Schuster as General Secretary, and three Vice-Presidents: George Ellery Hale (USA), Georges Lecointe (Belgium) and Vito Volterra (Italy). This executive committee really had a central role in the validation of the creation of different scientific societies and unions. The membership was from States only – represented by their academies or national societies (no individual members) – and the adhesion was strictly restricted to Allied Countries. Central Powers were excluded (Germany and its allies, Austria-Hungary, Bulgaria and the Ottoman Empire). Neutral Countries were considered on a case by case analysis.

The first Executive Committee of the International Astronomical Union met on July 28, 1919, which is considered the birth date of the IAU. Benjamin Baillaud was elected President of the Union. Alfred Fowler (UK) was the General Secretary, and four Vice-Presidents were installed: William Wallace Campbell (USA), Frank Watson Dyson (UK), Georges Lecointe (Belgium), and Annibale Riccò (Italy). Riccò passed away in September 1919 and Antonio Abetti (Italy) was co-opted to replace him. There had been a lot of preparatory work before this meeting. The first IAU Statutes, drafted by Alfred Fowler, had been adopted by the IRC on July 26. The reference statutes were published in the *Comptes Rendus de l'Académie des Sciences* (Lacroix 1919). A list of 32 IAU standing committees was approved, together with their chairmen. The approval of the Statutes is really where the memory of the IAU starts! The purposes of the Union defined in the statutes are: (i) *to facilitate cooperation in research among the astronomers of the different countries whenever this may be useful or necessary*; (ii) *to promote the study of Astronomy in all its branches*. Among the actions decided during this meeting, is mentioned the confirmation of their appointment to chairmen of the standing committees and the request to list the names of members and to start organizing their work. It was also decided that “*subject-matter for publication by the Union should be either in the French or English language, and that translations would not be necessary*”.

The IRC Constitutive Assembly also created two subsidiaries of the IAU: (i) the *International Time Commission*, actually the BIH in Paris; and (ii) the *International Central Bureau for Astronomical Telegrams* (*Bureau Central Internatinal des Télégrammes Astronomiques*), located in Copenhagen.

Other international unions were also created during the Constitutive Assembly of the IRC of July 1919. Among those: the *International Union of Geodesy and Geophysics* (IUGG); the *International Union of Pure and Applied Chemistry*; statutes were approved for the *Union of Biological Sciences* and the *International Union of Radio Science* (URSI), pending their approval by their respective academies.

4. Consolidation until the first General Assembly

Following the first Executive Committee of the IAU, which was held in Brussels on July 28, 1919, a number of actions had to be implemented, on the one hand for the Union to be formally approved by the *International Research Council*, and on the other hand in order to prepare the organization of the first General Assembly, which eventually took place in Rome on May 2–10, 1922.

In a letter to Fowler dated January 20, 1920, Baillaud accurately describes how the

General Assembly should proceed, mentions national reports, exhibits, invited discourses, etc, very much evocative of General Assemblies as they are carried out nowadays!

On June 23, 1920, Arthur Schuster, the IRC General Secretary sent a letter to Alfred Fowler, General Secretary of the IAU, stating that “*you have a sufficient number of countries to consider the Union as definitely formed*”. In a way this is the actual “birthday certificate” of the IAU. Five categories were defined by member state’s population, with increasing subscription rates and increasing voting power, and a sufficient number of large countries was needed in order to secure a viable budget. Schuster’s letter mentions Belgium, Canada, Greece, Japan, the UK and the USA. Two weeks later, on July 8, 1920, when Fowler informed the IAU members of the IRC validation, France had joined and Australia, Italy, and South Africa were being processed.

The Rome General Assembly was inaugurated in the Campidoglio on May 2, 1922 with pomp and circumstance, in the presence of King Vittorio Emmanuele III, Crown Prince Umberto, Cardinal Maffi and the Deputy-Mayor of Rome. The President of the Organizing Committee was Vito Volterra, who convened at the same time the General Assembly of the *International Geodetic and Geophysical Union*. Baillaud addressed the opening meeting as well as the closing ceremony, when the Executive Committee for the next three years, 1922–1925, was installed, under the presidency of William Wallace Campbell, one of the Vice-Presidents of the first Committee, and with Alfred Fowler running for a second term as General Secretary. This started the continuity of functioning over the years, which remains through to the present date.

5. Benjamin Baillaud’s heritage

Benjamin Baillaud certainly was a pure product of the French meritocracy. He was confronted, throughout his life, to new, complex challenges which he solved globally, successfully, and with a lot of resilience, in the long run. This was particularly true in Toulouse, where he had to manage all aspects all together in a synthetic way. The Toulouse Observatory was compared to a “*minutely regulated factory*” (Jérôme Lamy, PhD thesis, [Lamy 2004](#)).

If his younger years were during the period of the French Second Empire, his active life corresponded to the time of the French Third Republic, which fitted Benjamin’s spirit very well. He was strongly republican, with great integrity and liberal ideas. He certainly was an unselfish and effective organizer. Still he had a driving ambition to be successful and recognized; he considered ambition a “*social duty*”: “*I have always been ambitious, although I have forgotten how to be a plotter*” ([Baillaud 2011](#)). He always carefully and spontaneously acknowledged contributions, at all levels. For instance during the war, the male personnel was reduced and there were major contributions from several women “*Les dames de la Carte du Ciel*”, but also the support and operation of the *Bureau International de l’Heure*; he was particularly attentive to thank them officially.

The American astronomer Harlow Shapley (1885–1972) got to know Benjamin Baillaud personally from the time of the first General Assembly in Rome, which he attended. In March 1967, he wrote a letter to Lucien Baillaud, Benjamin Baillaud’s grandson, in which he brought up some recollections and appreciations: “*Baillaud was a man to whom you could apply the adjective kindly’. He was a natural internationalist and was therefore very effective in the good-will programmes of the IAU*” ([Baillaud 2011](#)). This respectful, caring and kind temper is certainly compatible with authority and effectiveness. This is a heritage that the IAU carries to this day; the Union is certainly a great place to live and work!

In a way, Benjamin Baillaud was the right person with the right experience at the right

time, particularly in the leadership of large international projects, and if the creation of the IAU was not his last action (he passed away in 1934) it is just as if all his career and experience had crystalized into the International Astronomical Union.

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