

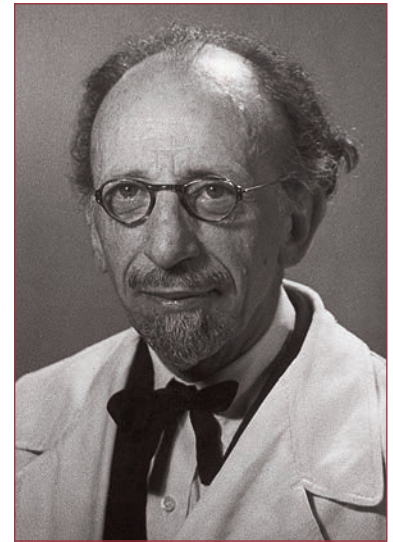
# IGNASI BARRAQUER

## I BARRAQUER

### BARRAQUER OPERATION

#### The eponym

**Barraquer operation.** Extraction of a cataract by suction using an erysiphake, an instrument for extracting the lens invented by Ignasi Barraquer circa 1917; the procedure uses the vacuum produced by a small suction cup to draw out the lens<sup>1</sup>. It is also known as Barraquer procedure, Barraquer method, Barraquer intervention, phacoerisis, phacoerysis, phakoeresis, phakoerisis and phakoerysis.



Ignasi Barraquer  
i Barraquer  
(1884-1965)

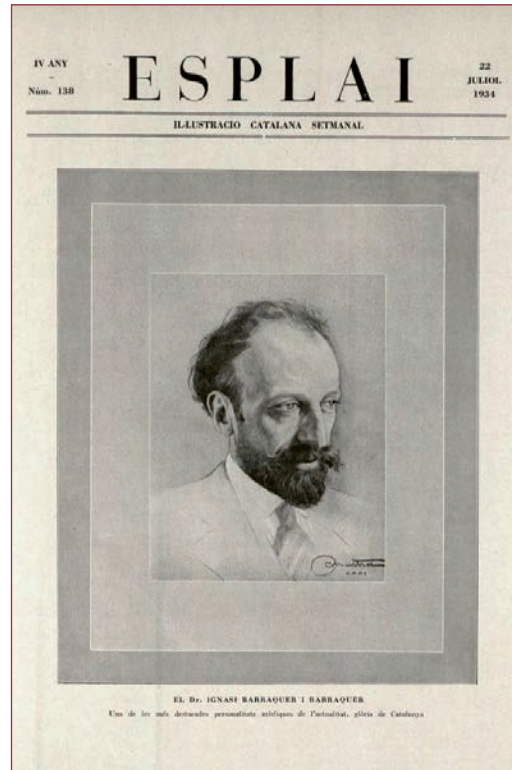
## Ignasi Barraquer i Barraquer (1884-1965)

Ignasi Barraquer i Barraquer was born in Barcelona on 25 March 1884 to Josep Antoni Barraquer i Roviralta (1852-1924) and Concepció Barraquer. After finishing secondary school in 1900, he studied medicine in Barcelona, graduating with highest honors in 1907. The following year, he was awarded a PhD for his thesis *Dacriocistitis* (Dacryocystitis). Long before studying medicine, he was an excellent carpenter and metalsmith and, at the age of fourteen, he had operated on cataracts in animals<sup>2</sup>. In 1904, he published his first scientific paper, *La tuberculosis del oído* (Tuberculosis of the ear), in the scientific journal *Gaceta Médica*<sup>3</sup>.

On graduation, he immediately began to work alongside his father, a great teacher and the founder of a line of ophthalmologists, as an assistant physician at the Santa Creu Dispensary and the Faculty of Medicine. From 1909 to 1918, he was associate professor and in 1919 he was appointed honorary professor of the *Instituto Rubio de Terapéutica Operatoria* in Madrid. From 1919 to 1923, he was the interim chairman in Barcelona, replacing his father, who had retired<sup>4,5</sup>. According to Pedro i Pons<sup>6</sup>, although Ignasi Barraquer was the ideal person to occupy the position permanently, he refused to sit the official examinations that university regulations required and had to give up this position. In the words of Pedro i Pons: "In the case of Ignacio Barraquer, this did not merely mean the loss of a teacher, but also of the school he gave rise to" [...] "He practised his mastery in a private clinic, just as he would have done in the Faculty of Medicine"<sup>6</sup>. Years later, in 1933, he would return to the university, but only briefly.

In 1910, he married Josefa Moner, with whom he had seven children. Two of them, Joaquim and Josep Ignasi, would follow in his footsteps in ophthalmology, also giving rise to eponyms (Joaquim Barraquer's eponym is detailed in a later chapter).

Ignasi Barraquer i Barraquer,  
front cover of *Esplai* (1934)



Barraquer studied many fields and areas complementary to ophthalmology. He studied mechanics, mold making, and plastic arts at the *Escola d'Arts i Oficis* in Barcelona. At the *Institut General i Tècnic* he studied physics and chemistry. He extended his studies at the *Universidad de Madrid* and the *Universitat de Barcelona* in the areas of comparative and human anatomy, emergency surgery, microbiology, general chemistry, and chemical and microscopic analysis. Furthermore, he studied botany at the *Laboratori Químic Farmacèutic* in Barcelona. He also undertook studies in histology, embryology, and parasitology at the *Université de Paris* and the *Université de Montpellier*<sup>2,5,7</sup>.

Ignasi Barraquer (to the right of centre of the photograph) during a surgical intervention at the *Hospital de la Santa Creu i Sant Pau*, Barcelona 1920s



Just nine years after completing university, in 1917, he made a definitive contribution to improving the technique of cataract operations. He sent the *Reial Acadèmia de Medicina de Barcelona* a description of his own technique for using of an apparatus of his own invention that he named *erisífac* (erysiphake, a glass suction cup activated by a pump that creates a vibratory vacuum). Furthermore, he described a good number of original operating procedures for other ocular afflictions (especially significant were his contributions to dacryocystectomy, sclerotomy in a single operation, and full keratoplasty) and around thirty original pedagogical apparatuses and instruments for ocular surgery<sup>4</sup>.

In 1928, as a permanent physician at the *Hospital de la Santa Creu i Sant Pau*, he organised an ophthalmology department which, thanks in part to his own valuable contributions, became a model institution in those times.

In 1929 and 1930, he was the president of the *Societat Catalana d'Oftalmologia*. In 1933, the *Universitat de Barcelona* named him an associate professor of the Faculty of Medicine; Barraquer carried out his teaching duties at the *Hospital de la Santa Creu i Sant Pau*, where he held a permanent position from 1928 onward. When the Spanish Civil War ended, he organised and directed the Ophthalmological Dispensary of the Red Cross of Barcelona until 1942.

## The erysiphake and the phacoerysis

Barraquer, who had a great sense of observation (according to Pedro i Pons, "in addition to his skillful technique, this man's personality comprises two qualities: insight and observational skills"<sup>6</sup>), had a new idea for extracting cataracts on observing how a leech gripped a stone in an aquarium:

"If one could grasp the lens of the human eye in a way like the leech grasps a stone and transfers it within the aquarium without displacing the water, the pneumatic suction produced by the suction cup would sever the fibres of the zonule -the ligament securing the lens- and thus gently extract the cataract with minimal trauma"<sup>5,6</sup>.

This simple observation, which he later put into practice, was the basis of his new surgical technique. So he built the necessary instruments, basically consisting of a glass suction cup and a mechanical device producing a vacuum that could be regulated to facilitate extraction of the lens. He called the procedure *phacoerysis* (*facoèrisi* in his native Catalan, or *facoérisis* in Spanish), from the Greek *phakós* = lens or lentil and

*haíresis*, *hairéseos* = the action of taking or receiving<sup>8</sup>, and he called the device an *erysiphake* (Catalan: *erisífac*, Spanish: *erisífac*)<sup>5</sup>.

On 15 March 1917, Ignasi Barraquer sent the Royal Academies of Medicine and Surgery of Madrid and Barcelona a manuscript entitled *Extracción ideal de la catarata* (Ideal extraction of the cataract), which was published in the May issue of the journal *España Oftalmológica*. In the article, he explained his new method in these words<sup>9</sup>:

“Avoiding all pressure on the organ and the use of cutting instruments within the ocular chambers is the only way to see the loss of the vitreous humor with full certainty. This idea constituted my objective when putting into practice my procedure for in toto extraction, regarding which I have the honour of informing this wise Corporation. It consists of adapting a small glass suction cup to the surface of the cataract, which captures it and allows its movement, its separation from the ligament, in a complete and gentle fashion. Thereby the action of withdrawing the instrument, without any traction or force whatsoever, sees the lens and its capsule fully withdrawn, with astounding ease, without the least violence to the eye. No compression is needed, nor entry into the eye of any other instrument.

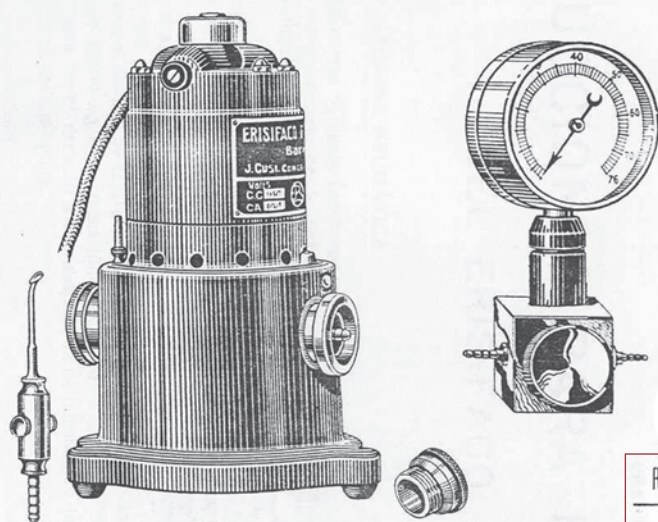
What is especially striking is the gentleness of the procedure compared to the extreme ocular deformations produced by the energetic compressions demanded by other procedures. It is of extraordinary simplicity, completely avoiding accidents, and enables delayed care since there is no need whatsoever for mydriatic eye drops, as no iritis occurs, nor can the border of the pupil adhere to the capsule or any vestige because there is none.

The instrument, which adheres to the lens like a suction cup, is mounted on the end of a special metal arm that enables one to establish, graduate, and interrupt the vacuum in the suction cup,



# ERISIFACO BARRAQUER

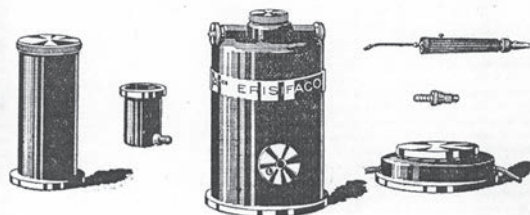
PARA LA EXTRACCIÓN  
TOTAL DE LA CATARATA



TIPO II

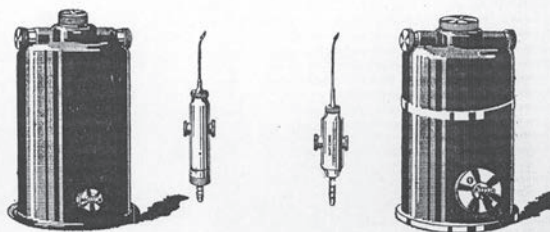
Barraquer erysiphake for extracting  
cataracts type II

## REPRODUCCIÓN GRÁFICA DE LOS DISTINTOS MODELOS DE ERISIFACOS



ERISIFACO MODELO N.º III

Máquina neumática, con graduador de vacío y dispositivo para llenar y vaciar automáticamente el aparato, cánula-ventosa, pedal, interruptor, recipiente de aceite y embudo para introducir el lubricante en el aparato, de metal.



ERISIFACO MODELO N.º IV

Máquina neumática y cánula-ventosa con válvulas metálicas y graduador de vacío.

ERISIFACO MODELO N.º V

Máquina neumática con graduador de vacío y cánula-ventosa con válvulas de caucho.

Barraquer erysiphakes for extracting  
cataracts, types III, IV and V

provided along its length with a conduit through which a special device constantly blows air, activated by an electric motor.

As well as avoiding the eight defects and dangers noted above, the advantages of the new procedure are such that all types of lenticular and capsulolenticular cataracts may be extirpated, whether or not their development is mature, and even, highly advantageously, the transparent lenses of myopics. There is no need to lift the bandage until it is definitively removed, it does not leave the high degree of astigmatism seen in procedures that deform the eye, and the patient operated upon enjoys full sharpness of sight as soon as the dressing is removed and they use suitable lenses”.

Shortly afterward (1920), he presented extensive results at the *Primer Congreso Nacional de Medicina* (First National Congress of Medicine) with a paper and conference called: *Crítica de los métodos modernos de extracción de la catarata* (Criticism of modern cataract extraction methods) and *Sobre mil facoérisis* (On 1,000 phacoeryses)<sup>10</sup>. In 1922, he presented a paper at the International Congress of Ophthalmology in Washington<sup>11</sup>, and in 1923, summarising seven years' experience, he published: *La enseñanza de siete años de facoérisis* (Lessons from seven years of phacoerysis) in the journal *La Medicina Íbera*<sup>12</sup>.

This procedure<sup>13</sup> revolutionised ophthalmic surgery and it spread around the world, supplanting the previously most-used procedure, which employed forceps instead of a suction cup and had various drawbacks during and after surgery. At one international ophthalmology congress where both techniques were being discussed, Barraquer, amidst great expectation, stood up to defend his technique, saying: “Gentlemen, one might compare the lens expressor forceps with a cat's claw and my glass suction cup with the lips of a beautiful woman. Which would you prefer to feel on your cheek?”. With these words, which elicited a murmur of approval among the public, the discussion was considered closed<sup>5,6</sup>.



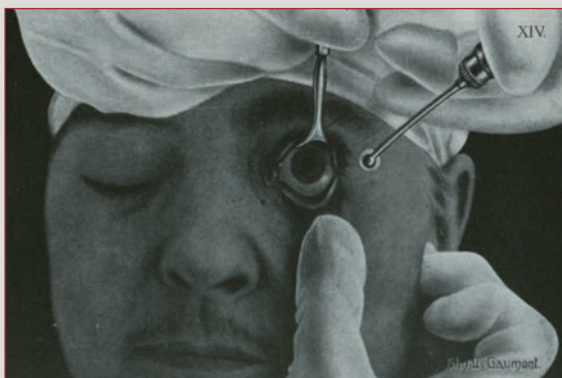
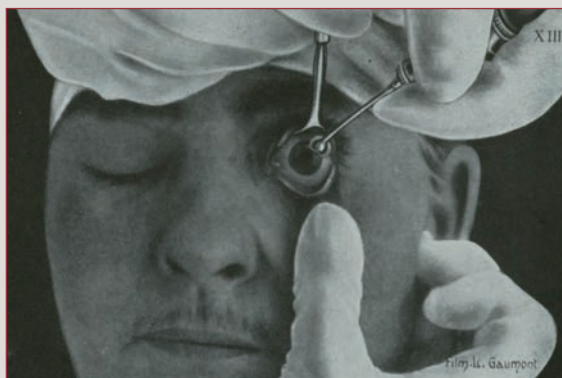
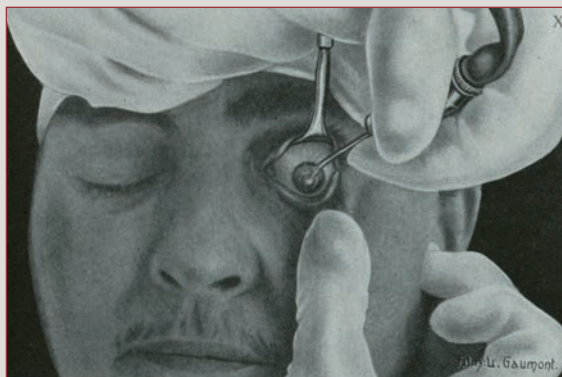
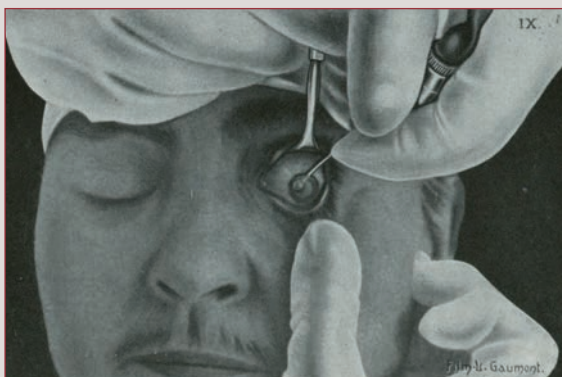
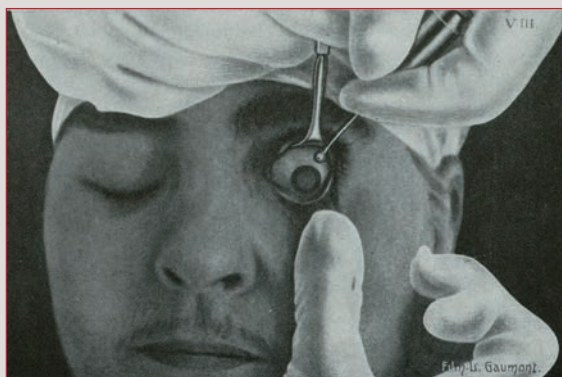
In the course of his professional life, he conducted over 30,000 operations and his patients included people from all walks of life, from the Empress Eugénie de Montijo, the wife of Napoleon III, to many patients of modest means or on charity.

## The Clinic, the Foundation and others

His best-known work is, without doubt, the new *Clínica Barraquer* which was inaugurated in September 1940. It was there that, in addition to his medical duties, he undertook extensive teaching activity. *Clínica Barraquer* was possibly the first serious attempt to create a centre where both rich and poor could enjoy identical quality of service. Right from the start, the clinic had some charity beds in addition to beds for private patients. After resigning as the head of the department at the *Hospital de la Santa Creu i Sant Pau* –Ignasi Barraquer had initially wanted to situate his project within the grounds of this hospital, but before the Spanish Civil War he clashed with the hospital's *Muy Ilustre Administración* (Highly Illustrious Administration)– he devoted himself body and soul to his new centre, in which he invested a large portion of his family's money<sup>14</sup>.

Ignasi Barraquer and his wife founded the *Institut Barraquer* on 15 April 1947, in memory of his father, Josep A. Barraquer i Roviralta. The *Institut Barraquer* was an independent, self-financed, scientific association, dedicated to ophthalmology research and teaching, exchange of ideas and scientific discoveries, improvement and dissemination of medical and surgical therapies, and general advancement of ophthalmology. In 1973, the Clinic and the Institute merged under the same name: *Centre d'Oftalmologia Barraquer*.

Barraquer's hobbies included cars (he was both a skilled mechanic and an adept driver), architecture, and decoration (though he claimed to have no artistic tendencies<sup>6</sup>, the distribution, proportions, and functional



Barraquer operation: phacoemulsification

order of *Clínica Barraquer* –which he himself designed– demonstrate otherwise), and zoology. His love for and curiosity about animals led him to create a small zoo in the gardens of his home in Barcelona (first at Torre Vilana, in the neighbourhood of Bonanova, and later at his home in Pearson Avenue). It seems that his favourite animals were chimpanzees, and he can be seen with them in many photos. This hobby probably also explains why he was a great fan of circuses, which he regularly attended (especially *Circ Olímpia* in Barcelona)<sup>6</sup>.

He received numerous awards and decorations, both in Catalonia and abroad. In 1964, he fell seriously ill with a hepatic infection<sup>2</sup>. He died in Barcelona on 13 May 1965. He had decided to donate his eyes; the extraction was carried out by his son Joaquim<sup>6</sup>, and his corneas were transplanted into two blind patients<sup>2</sup>.

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