

ART OF WEATHER INSTRUMENTS FOUNDATION

Paper Meteorology

Cobalt Postcards, Donkey Barometers
and the Caricature of the Instrument

*On a forgotten genre of printed “barometers” from the turn of the twentieth century, and
on why the joke about the forecast outlived the forecast itself*

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1. The cobalt postcard: reconstructing the formula and putting it into production

This subject began with an object that came to me by chance — a French *Baromètre artistique* card of the interwar period with a Lourdes motif. A printed lithograph: the grotto, the Virgin, roses, a view of the basilica, a ribbon reading *Protegez-nous*. And at the bottom, at the feet of the figure, a pool of water filled in with something that on that particular day was a deep blue and clearly did not belong to the original printer's palette. Above the frame stood the instructions: the glazed part changes colour; blue for fair, violet for changeable, pink for rain or damp.

An instrument without a single moving part. No tube, no capsule, no pointer. A piece of paper that knows more about the air than some aneroids in carved cases.

I wanted to reproduce it myself, and what followed took several months and turned out to be more interesting than I had expected.



"Baromètre artistique", France, 1930s–1950s. Hand-coloured lithograph, Lourdes motif; the cobalt zone is the pool at the figure's feet. AWIF collection.

The chemistry is simple and rather beautiful. What does the work is the equilibrium between two cobalt(II) complexes: the pink octahedral $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$ and the blue tetrahedral $[\text{CoCl}_4]^{2-}$. In dry air water leaves the film and the equilibrium shifts towards the blue chloro-complex and the lower hydrates; in damp air the ions are hydrated back to pink. The intermediate violet is a mixture of forms. The transition is reversible an unlimited number of times, and for a plain impregnation the threshold sits at roughly 40–60 % relative humidity — and can be moved with additives.

I assembled the formula from old recipe books of the turn of the century and then brought it to working order experimentally. The version that emerged: 100 ml distilled water, 3 g gum arabic, 7 g $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$, 2 g sodium chloride, three drops of glycerine. Gum arabic was chosen over gelatine — it dissolves in cold water, does not go mouldy, and dries into a thin flexible film that grows into the cellulose fibres. The sodium chloride sets the threshold: an excess of chloride ions stabilises the blue form, so the card turns pink only in genuinely damp weather. The glycerine acts as a plasticiser, and here it is important not to get carried away — overdo it and the patch stays pink forever.

Preparation took one night: the gum arabic is stirred into cold water and left to swell until morning, then the salts go in, then the glycerine, and the whole thing is passed through a paper filter. Kept under a lid, the solution lives for months.

Then came the trials. I compared three versions of the mixture — the original, one diluted with water, and one with isopropanol added — under four conditions: at a room humidity of about 60 %, after five minutes over a bowl of water, after half an hour over the same bowl, and five to seven minutes after coming back into the room. The alcohol version outperformed the others: it wets the paper more evenly, and the layer sits denser and without blotches. For the final batch the remaining solution was adjusted — isopropanol was added, along with a little more cobalt salt for colour saturation and a drop of glycerine.

One observation from those trials was unexpected. The return to blue looks noticeably faster than the shift to pink, although the equilibrium is symmetrical. The explanation is partly optical: the molar absorptivity of the blue tetrahedral complex is roughly a hundred times higher than that of the pink octahedral one, so the eye needs only a tiny fraction of converted ions to register blue. The chemistry runs equally in both directions; it is our eyesight that is biased.

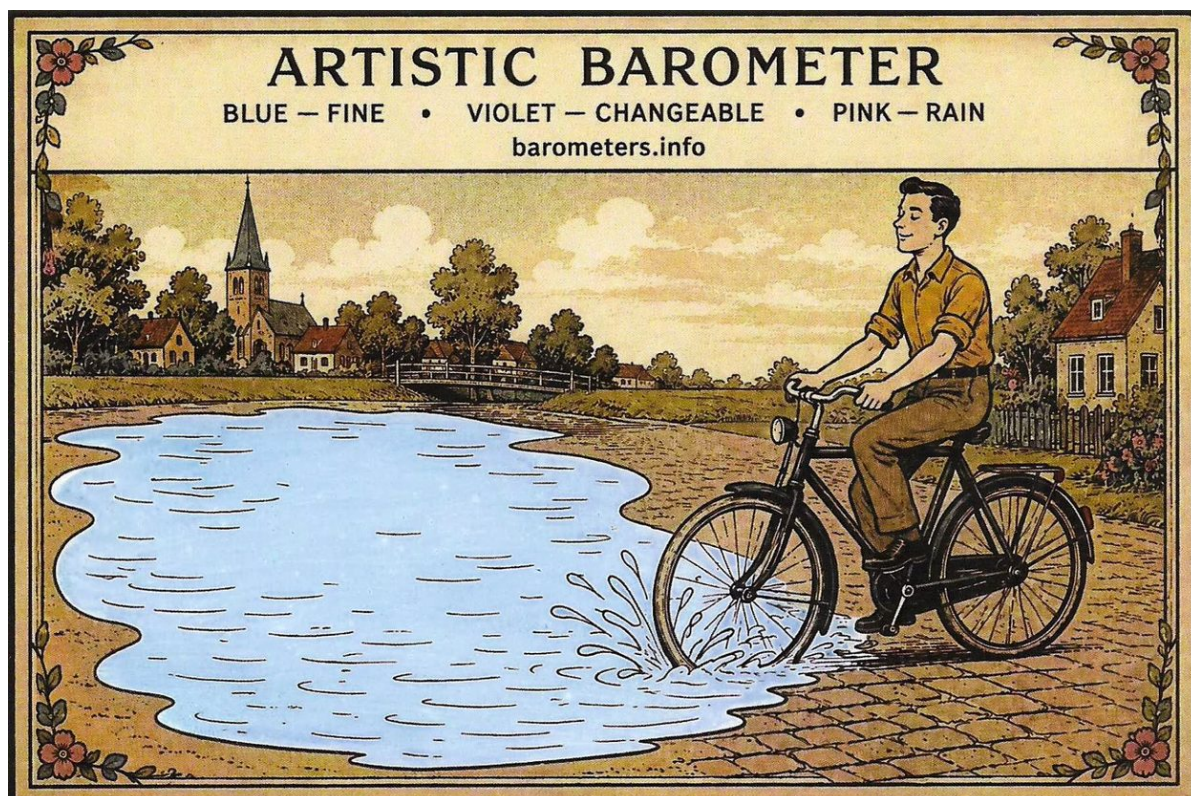
Application turned out to be a finer business than the chemistry. The brush is kept slightly damp, three coats, each dried with warm air; a thick layer responds slowly, and the salt crystallises out on the surface and flakes off. The wash is stopped one or two millimetres short of the printed black outline — the solution will creep along the capillaries and reach the line by itself, whereas if you start flush against it, it will step over. Calibration is done over jars of saturated solutions: over magnesium chloride (about 33 % relative humidity) the patch should be blue, over sodium chloride (about 75 %) pink.

All of that, though, is only half the work. The other half is compositional, and it proved no easier.

The cobalt patch has to make sense in all three states at once. Not "blue as the normal state and pink as a malfunction", but three equally valid readings of one picture. The test is simple: if the object looks absurd in pink, the subject needs changing. Out of that came a

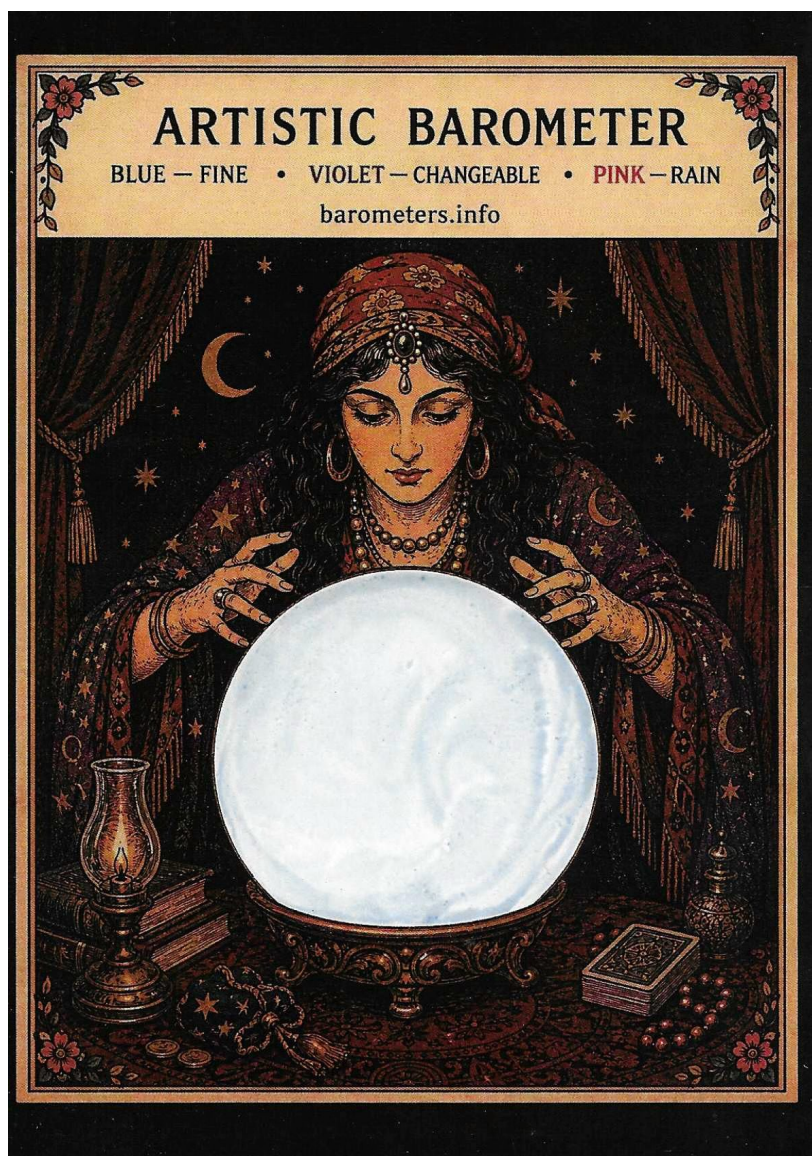
series of four cards.

The Cyclist. A Dutch village: a church tower, tiled roofs, cobblestones. A young man with rolled-up sleeves rides straight through a puddle, the front wheel already in the water, spray flying off the rim. The puddle is the cobalt zone — it takes up more than half the frame and was left unprinted so that the solution could go directly onto the paper. A blue puddle is an ordinary one, left over from yesterday; a pink one is the puddle he is about to ride into. The visual style is borrowed from French chromolithography: flat fills, heavy black outlines, dot stippling, a muted ochre-and-sepia palette.



"ARTISTIC BAROMETER": the cyclist. *barometers.info* series; the cobalt zone is the puddle.

The Fortune Teller. A dark tent, curtains with tassels, stars and crescent moons, an oil lamp, a deck of cards, a woman in a headscarf bent over a crystal ball. The ball is the cobalt zone. Here it is not everyday logic that operates but the logic of the genre: the ball is obliged to change colour that is its job.



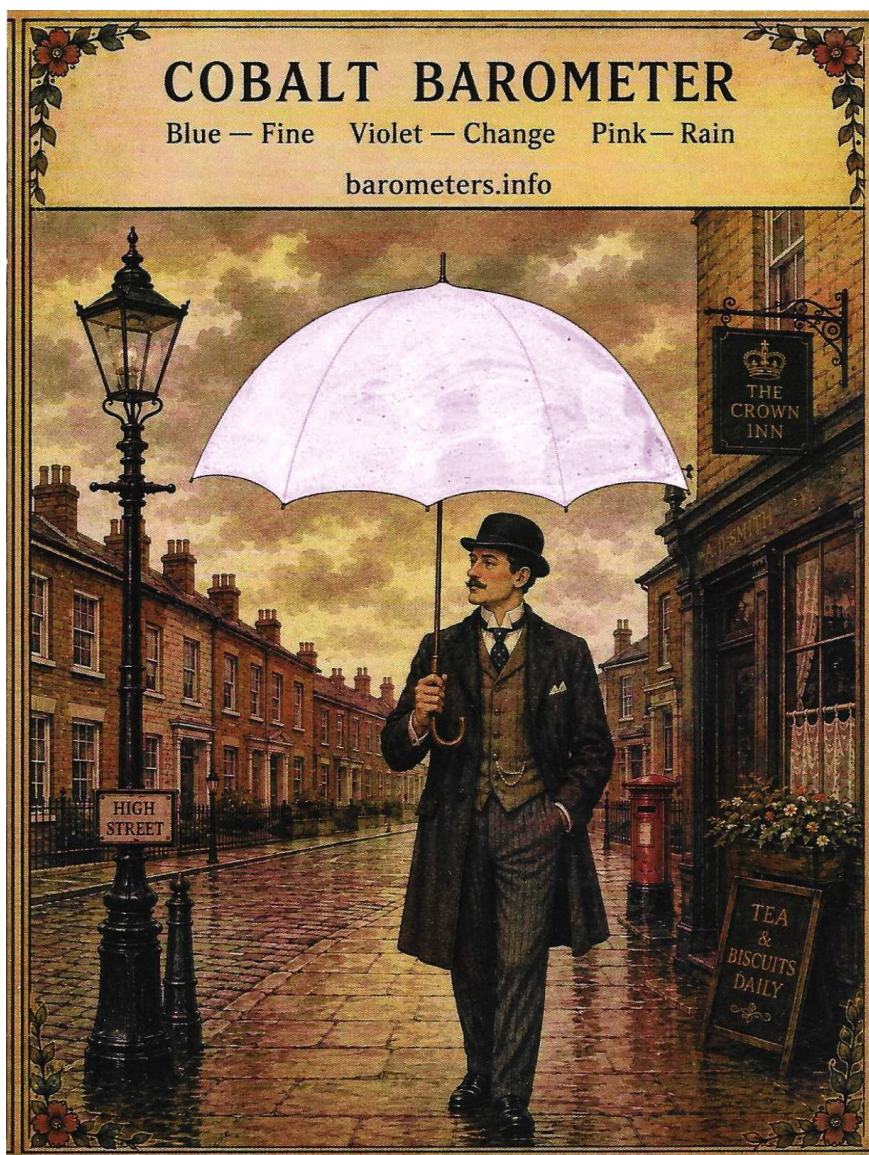
"ARTISTIC BAROMETER": the fortune teller. The cobalt zone is the crystal ball.

The Apothecary. A late nineteenth-century interior: shelves of apothecary jars (*Tinct. Opii, Spirit. Aethyl., Ung. Menthol., Aq. Rosae, Tinct. Arnicae, Pulv. Ipecac.*), drawers with Latin labels, scales by the window, a chemist with a pestle in his mortar, a sign on the wall reading *Primum non nocere*. At the centre, larger than anything else, stands a bottle labelled **COBALTI CHLORIDUM, ad usum meteorologicum**. The card is not pretending here: the painted bottle contains precisely the substance the card itself is coated with, named in pharmacopoeial Latin, and the second line parodies the canonical *ad usum externum*. The chemist behind the counter would have recognised his own stock — cobalt chloride really was sold in pharmacies, for sympathetic inks and for "weather flowers", and as late as the mid-twentieth century it was an ordinary household reagent.



"ARTISTIC BAROMETER": the apothecary. The cobalt zone is the bottle of Cobalti chloridum, ad usum meteorologicum.

The Umbrella. An Edwardian street: a gas lamp, the sign of *The Crown Inn*, a red pillar box, a chalkboard promising tea and biscuits daily, wet pavement. A gentleman in a bowler walks under an open umbrella; the canopy is the cobalt zone. Compositionally this is the simplest card of the series and probably the most immediately legible to a buyer. Strictly speaking it breaks the rule I had formulated myself: the sky here has already made up its mind, the pavement is glistening, and in the blue state the umbrella looks like over-caution. But an Englishman over-insured beneath an umbrella in fine weather is no less true to life than an Englishman in the rain, so the breach turned out to be tolerable.



"COBALT BAROMETER": the umbrella. The cobalt zone is the canopy.

By the fourth card the heading changed as well: "ARTISTIC BAROMETER" gave way to the more honest "COBALT BAROMETER". The first is a historical quotation, the second a description. Both versions, admittedly, still call a hygrometer a barometer, so the honesty is relative. This is worth saying plainly and once: the card measures relative humidity, not atmospheric pressure. But in the early twentieth century the word "barometer" meant to the ordinary buyer not "an instrument for measuring pressure" but "a thing that tells you about the weather", and publishers made free use of the fact. The genre has come down to us under a name that does not belong to it, and it is kept here as a nod to tradition.

It was out of this work that an interest in the genre as a whole grew — and the genre turned out to be far wider than its cobalt branch.

2. The chemical basis: cobalt chloride as a humidity indicator

The colour trick of the cobalt salts has been known for a long time and entered the culture well before it became a souvenir.

In the eighteenth century cobalt solutions served as sympathetic ink: writing made in a pale solution appeared in blue when heated and vanished again on cooling. The French chemist Jean Hellot (1685–1766), a man of wide range — from metallurgy and dyeing to porcelain — worked specifically on invisible inks, and cobalt was among his subjects. The amusement survived in chemistry cabinets for two centuries and lives on today in school demonstrations.

The meteorological application took shape later. In 1877 *Scientific American*, relaying the *Journal of the Franklin Institute*, described hygroscopic paper as a thoroughly practical instrument: blotting paper is impregnated with a concentrated solution of cobalt chloride, it turns blue in dry air and red in damp, and a year of observations taken four times a day showed that the hygrometric state of the air can be determined this way quickly and accurately. The tone of the note matters: this is not a curiosity but a proposed method of measurement.

The scientific line did not stop there. In 1945 the *Annals of Applied Biology* published M. E. Solomon's detailed paper on the use of cobalt salts as indicators of humidity and moisture — the very one still cited by manufacturers of indicator cards today. Industry adopted the trick for good: cobalt chloride is used to colour silica gel so that a spent desiccant is visible at a glance, and to print the indicator cards packed alongside electronics. By estimates from the late 1990s, some two thousand tonnes of cobalt indicating gel were being consumed worldwide each year.

The irony is that industry also finished the genre off. In December 1998 cobalt chloride was classified in Europe as a category 2 carcinogen; the International Agency for Research on Cancer places it in group 2B, and it is among the most frequent contact allergens in patch testing. Manufacturers of indicators then began hurriedly looking for substitutes — copper-based, lanthanide-based, cobalt-free — and the cheerful postcard with its pinkening puddle passed into the category of things that are easier to collect than to make.

3. Cobalt "barometers": three-dimensional forms and the Polish radium barometer

Within the printed genre, cobalt "barometers" form a separate and almost unstudied line. There are no catalogues; what is known has to be assembled from the objects themselves. A substantial share of the items described in this essay belong to the collection of the Art of Weather Instruments Foundation (AWIF) — the foundation I represent, which is concerned with the preservation and study of meteorological instruments.

Three-dimensional forms. Besides cards, the compound was applied to figurines. In the United States there are the ceramic "weather owls" — owls usually perched on a stack of books, with a "Weather Owl" sticker; on most surviving examples the coating is long spent and the colour no longer moves. There were also premiums in Cracker Jack boxes: a piece

of card with a fuzzy patch that turned blue and pink. Our foundation's collection holds a European relative of this tradition — a souvenir model of the amphitheatre at Nîmes, coated all over in the cobalt compound with mother-of-pearl glitter mixed in: in dry air the Roman arcades take on a lilac cast, in damp air they turn pink, while the white base stays neutral. The device here is entirely candid: it is not a detail of the scene that receives the colour, but the whole object.



Model of the amphitheatre at Nîmes. Souvenir figure coated with the cobalt compound and mother-of-pearl glitter. AWIF collection.

Radium Barometer, Poland, around 1930. One of the most characteristic objects of its era in our collection. A small card measuring 85 × 110 mm, printed by a Polish press and bearing no publisher's name, carrying an illustration, printed instructions and a colour legend for reading its indications: *niebieski — POGODA, liljowy — ODMIANA, różowy — BURZA*.

The design is in the spirit of interwar decorative graphics, close to the aesthetics of Art Deco. Around the perimeter runs an ornamental border of a repeating geometricised motif with oval elements and angular inserts. At the centre, within a rectangular field, is a female figure in a light dress in a dynamic pose, arms flung wide: she seems to be stepping forward, or into a current of air. Here the figure personifies sensitivity to changes in the atmosphere.

The format of the card, the economy of the composition and the combination of image with explanatory text all mark the object out as a souvenir or a decorative domestic curiosity. Its purpose was twofold: to popularise science in everyday life, and to feed the cultural cult of Marie Skłodowska-Curie, which in the Poland of the 1930s was a nationwide phenomenon. Radium was a magic word in interwar advertising — it was stamped on cosmetics, tooth powder, mineral water and, as we see, weather cards. There is of course no radium in the object: what does the work is the same cobalt salt as in the French *Baromètre artistique*. This is a pure case of marketing reinvention — old chemistry repackaged in the rhetoric of the decade's most fashionable science.

That is precisely what makes the card valuable. It records the moment when the genre stopped appealing to common sense ("a thing that shows the weather") and began appealing to prestige ("a thing working at the frontier of physics"). A move that has been repeated countless times since, with only the name of the fashionable science changing.



Radium Barometer, Poland, around 1930. Card 85 × 110 mm, Art Deco, female figure, colour legend niebieski / liljowy / różowy. AWIF collection.

What all these objects have in common is one thing. They were sold not as instruments but as souvenirs with a hidden trick — and the trick was real. Unlike everything that follows.

4. The donkey barometer: origins and a documented chronology

If the cobalt card deceives the buyer in its name but honestly does its work, the next genre is built the other way round: it does not work at all, and makes no secret of it. And it is this one that turned out to be immortal.

The donkey barometer consists of a piece of card showing the hindquarters of a donkey or mule and a real tail of wool, string or thread, glued or sewn to the card. Beside it are the printed instructions: hang the card outside and look at the tail. Dry — fair. Wet — rain. Swinging — windy. Wet and swinging — stormy. Frozen — cold. More elaborate versions add fog (the tail cannot be seen), snow (the tail is white) and a closing flourish: if the tail has fallen off, earthquake.

The joke is so obvious that it feels like folklore, anonymous by nature. All the more surprising, then, that it has a documented point of entry into commerce.

J. B. Carroll, Chicago, 1906

The earliest securely dated example is held in the Prints and Photographs Division of the Library of Congress (the Karen A. Stuart collection of postcards). It is a colour zinc engraving on a card of postal format, 14 × 9 cm, with fibre in place of a tail; printed on the front: copyright 1906 by J. B. Carroll, Chicago, patented 5 February 1907. The catalogue description records exactly what the object shows: a rear view of a mule, a string tail, and directions for forecasting the weather from its condition.

This particular copy has a biography. It went through the post: addressed to Dr A. B. Hool in Washington, postmarked Atlantic City, New Jersey, 23 August 1907. The card, in other words, was bought at a seaside resort and sent as a souvenir — precisely the pattern of use it was designed for. The copy in our foundation's collection comes from the same print run and carries, in the lower margin, a handwritten line from the sender asking the recipient to take good care of the tail.



"Mule Barometer". J. B. Carroll, Chicago; copyright 1906, patented 5 February 1907. Zinc engraving with fibre; handwritten line from the sender. AWIF collection.

It is worth being clear about what Carroll actually secured. He did not invent the joke — it had almost certainly circulated orally among farmers long before. What he did was different: he fixed it in a stable set of formulations, tied it to a specific image and protected the composition in law. From there it could be printed in quantity and, if desired, defended against imitators. Imitators appeared at once — Schmidt Bros. & Co., Chicago, 1911, for instance. Theirs is a card of the same type but with a different, more painterly mule: tonal, almost watercolour, with trees and a stone wall behind. The lower margin is stamped *Pat. Appld. For — Schmidt Bros. & Co., Chicago*, with the date 1911 alongside. On the reverse of another copy from the same publisher the patent has already been granted: **Patent No. 1,012,747, Dec. 26, 1911**. What exactly the patent covered is unfortunately unknown. It may have been the "instrument" as a whole, or the method of fixing the fibre to a printed card, or the wording of the directions.

The advertising line: brass, plumbing and the absence of kicking

The best-known American version is the advertising card of the Central Brass Manufacturing Co., founded in 1895 in Cleveland, Ohio, and still making brass plumbing fittings today (now part of Pioneer Industries). The card reproduces Carroll's composition — mule, tail, the same list of readings — and adds an advertising block underneath with a pun: for those who use the highest grade brass goods, *there is no kick coming*.

The advertiser's logic is transparent. You give the plumber something he will hang in his workshop and show to visitors, and which costs nothing beyond the printing. It is an early and almost flawless piece of promotional merchandising: zero utility, total recall.

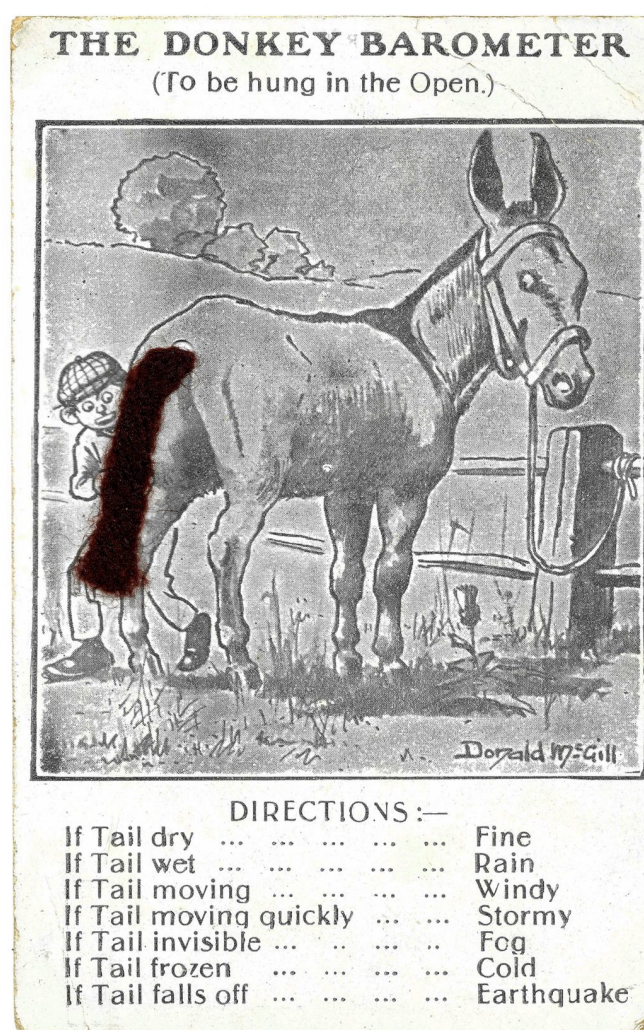


"Mule Barometer", advertising card of Central Brass Mfg. Co., Cleveland.
The same canon plus an advertising block.

The British line: Donald McGill

In Britain the subject was taken up by Donald McGill (1875–1962) — the future "king of the saucy postcard", then only just beginning: he took up postcard drawing full time in 1904, working for the Pictorial Postcard Company, and his early period falls precisely in 1907–1914. The card "The Donkey Barometer (To be hung in the Open)" is a halftone print with the artist's signature in the lower right corner and a real dark-crimson woollen tail glued to the sheet. The scene is enriched: behind the donkey stands a boy in a cap, plainly intending to pull that tail. The list of readings is extended to seven lines and ends with an earthquake.

No precise date of issue is printed on the copy; catalogue datings hover between 1907 and 1910, and this is a case where caution serves better than confidence. What is certain is something else: by the end of the 1900s the joke was equally legible on both sides of the Atlantic, and the European versions almost always added a final catastrophe to the American canon — a tornado or an earthquake. The American edition stopped at frost; the European carried on to the end of the world.



"The Donkey Barometer (To be hung in the Open)". Donald McGill, Britain, c. 1907–1910.
Woollen tail, seven readings. AWIF collection.

Continental variants: a cow, a tavern, a tourist souvenir

From here the genre spreads and mutates.

The French card *Baromètre pour l'extérieur* is die-cut, with a bright ginger cow in a green meadow, a fence and cypresses, drawn in the coarse manner of cheap chromolithography, and a thick red woollen tail on an eyelet. Six readings set in a grotesque type: swinging hard — storm; stirring gently — a light breeze; dry — fine dry weather; invisible — fog; stiff — frost and snow; wet — rain. The donkey has been replaced by a cow; the joke is none the worse for it.



"Baromètre pour l'extérieur". France, die-cut card with a cow and a red woollen tail. AWIF collection.

The Austrian variant went further from the prototype. The photographic postcard "Barometer der Weinstube Schicketanz" shows a carved wooden board under a gabled roof with dragon heads at the corners, gothic lettering, and a real rope hanging down the middle. The text is in rhyme, in Bavarian-Tyrolean dialect, and does not confine itself to the weather: if the rope is dry the sun is beating down, so come inside and sit in the cool; if it is wet the rain has set in, so drink a litre from the barrel; and if anyone sees the rope double, he is thoroughly fogged in himself. The board closes with a commercial proposition: a quarter litre whets the appetite, a half makes you merry, a litre gives you courage, and after that you even start talking sense. At the foot of the card is a greeting from the Kufstein *Batzenhäusl*, the town's oldest wine house, also known by the name Schicketanz.



"Barometer der Weinstube Schicketanz". Photographic postcard, Kufstein, Tyrol; carved board with a rope and a rhymed text in dialect. AWIF collection.

A characteristic transformation has occurred here. The parody of meteorology has become the sign of an establishment: the "instrument" no longer parodies anything, it lures customers. The same evolution was undergone by the post-war souvenirs — the ceramic and wooden donkeys with little tails produced in the 1950s and 1960s in West Germany, Japan and Taiwan for the tourist market; examples bought in Rothenburg in the mid-1960s turn up among collectors with a guarantee that they still work.

The stone heir

By the end of the twentieth century the printed form had died out, but the joke had not. It migrated into the *weather rock*: a stone hung from a tripod or a rope with a sign explaining how to take its readings. Reference definitions describe it as a humorous display poking fun at the intricate technology of modern forecasting and at its less than perfect accuracy. The list of readings repeats the donkey's almost word for word: wet — rain; swinging — wind; casting a shadow — sun; not visible — fog; white on top — snow; coated in ice — frost; bouncing — earthquake; missing — tornado.

The earliest described portable example is the "famous Maine weather stone" from the Audubon camp on Hog Island, recorded in print in late 1981. Today such stones stand in parks and outside pubs from Yorkshire to Cornwall, and are regularly taken for an ancient local tradition. The tradition is indeed old — but it is made of paper, not stone, and it goes back to a Chicago publisher who took out copyright on a donkey's tail.



The weather rock: a modern "Weather Stone Forecast" board — the direct heir of the donkey barometer, down to the earthquake.

5. The donkey barometer today: notes on a new edition

The temptation to make such a card myself was strong, and I did not resist it.

The card issued under our foundation's imprint is called "The Donkey Barometer. Not Approved by Clergy or Scientists" and is built on a deliberate clash of registers. The image is not a drawing but a photograph: warm evening light, a donkey at a wooden gate strung with wire, a golden field behind, and a muzzle turned towards the viewer with an expression that can only be called derisive. A geometric ornamental border runs down the left-hand margin, and the foundation's mark runs vertically on the right. The tail is plaited,

greenish-grey, fixed by hand; on every card it comes out slightly different, and this is probably the only part of the work that connects a publisher of the twenty-first century with one of 1906.

The legend runs to seven lines. The first six reproduce the canon: dry — clear; wet — rain nearby; moving — wind; moving fast — stormy; invisible — fog; frozen — bitter cold. The seventh breaks it: if the tail looks oddly stylish — rainbow. That line does to a venerable joke of 1906 exactly what the present decade does to every inherited text — it inserts an agenda into it. The donkey, it should be said, took this stoically.

The subtitle about the absence of approval from clergy or scientists points to the essence of the genre: the printed barometer was always an object claiming neither blessing nor verification, and that is exactly its value.



"The Donkey Barometer. Not Approved by Clergy or Scientists". AWIF edition; the plaited tail is fixed by hand.

Making it yielded one observation not to be found in the literature. The donkey barometer is the only type of "instrument" that cannot be made badly. A cobalt card may fail: the layer

goes on unevenly, the threshold drifts, the colour sticks at violet, the paper turns out to be coated. The tail always works. In that sense the joke of the nineteenth century proved more soundly engineered than the chemistry of the twentieth.

6. Why the genre appeared when it did: the mass forecast and its public failures

There remains a question usually answered in passing: why did the parody of meteorology appear precisely at the turn of the twentieth century, and not earlier?

The answer has three parts.

The forecast became public. In the mid-nineteenth century the barometer was an object of status: it was kept by sailors, landowners, apothecaries and physicians, and for most of the population atmospheric pressure remained an abstraction. By the 1900s this had changed: networks of observing stations, the telegraph, a daily weather report in the newspaper. The forecast ceased to be a privilege and became a household text read over breakfast.

The forecast began to fail publicly. As long as predicting the weather was a private affair, its misses stayed private. Once the report reached the front page, every miss became common property and a subject for table wit. Parody appears not when a science is weak, but when it is strong enough to make testable claims and confident enough to make them daily.

A medium appeared. The period from roughly 1890 to 1915 is what historians call the golden age of the postcard: cheap colour printing, mass postal service, an established souvenir industry, resort retailing. For the first time the joke had a material form that could be printed in quantity, sold for a penny and put in the post. Without that infrastructure the donkey barometer would have remained a spoken quip.

The geographical shift is explained the same way. By the 1900s the United States had a developed entertainment industry — fairs, resorts, comic magazines, promotional souvenirs — and patent practice was democratic enough that protecting a joke article troubled nobody. In Britain, the home of the classical barometer — Fitzroy, Negretti & Zambra — the instrument retained the reputation of a national achievement for longer; the mockery arrived later and more gently, through the comic postcard rather than the patent office.

But the most interesting developments took place not in the souvenir shop but in the pages of the satirical magazines. There the barometer ceased to be an object and became a metaphor.

7. The instrument in caricature: *Punch*, 1901

Punch, or *The London Charivari*, published from 1841, was a machine for converting public anxieties into drawings. By the 1900s there were anxieties enough: the motor car, the airship, the first flights, electricity, the telephone. Progress was moving faster than the public could get used to it.

The drawing by Charles Harrison (d. 1943), one of the magazine's leading cartoonists of the Edwardian era, is titled "Increased Activity of the Police. A possibility of the very near future." A fantastical machine hangs in the air above the city: a striped hull with membranous wings and propellers, from which an open carriage without wheels is suspended on a chain, carrying a lady and a gentleman in a cap at the controls. A policeman with mechanical wings on his back and a chronometer on his chest is giving chase; several more such officers hover in the distance. The caption is the constable's line, delivered from the "aerial division": thirty miles an hour will not do up here, he has timed them, and they will have to come down with him to the station.



"Increased Activity of the Police." Charles Harrison, *Punch*, 1901; French reprint credited to the London original. AWIF collection.

The key detail is the name of the instrument with which the constable supposedly took his reading. In the original caption it is not simply an aneroid but an "aneroid barometrical check clock" — a compound phrase denoting nothing that exists. That is the whole point. The joke is not that a barometer is used to measure speed; the joke is that the policeman gives the device a long scientific name, and that is enough for nobody to dare argue. Harrison caught the mechanism of the age exactly: the authority of measurement rests not on understanding but on terminology.

In later reprintings — including the French version, where the drawing is credited to the London *Punch* — the compound name was simplified to "aneroid barometer", and the joke

lost half its edge.

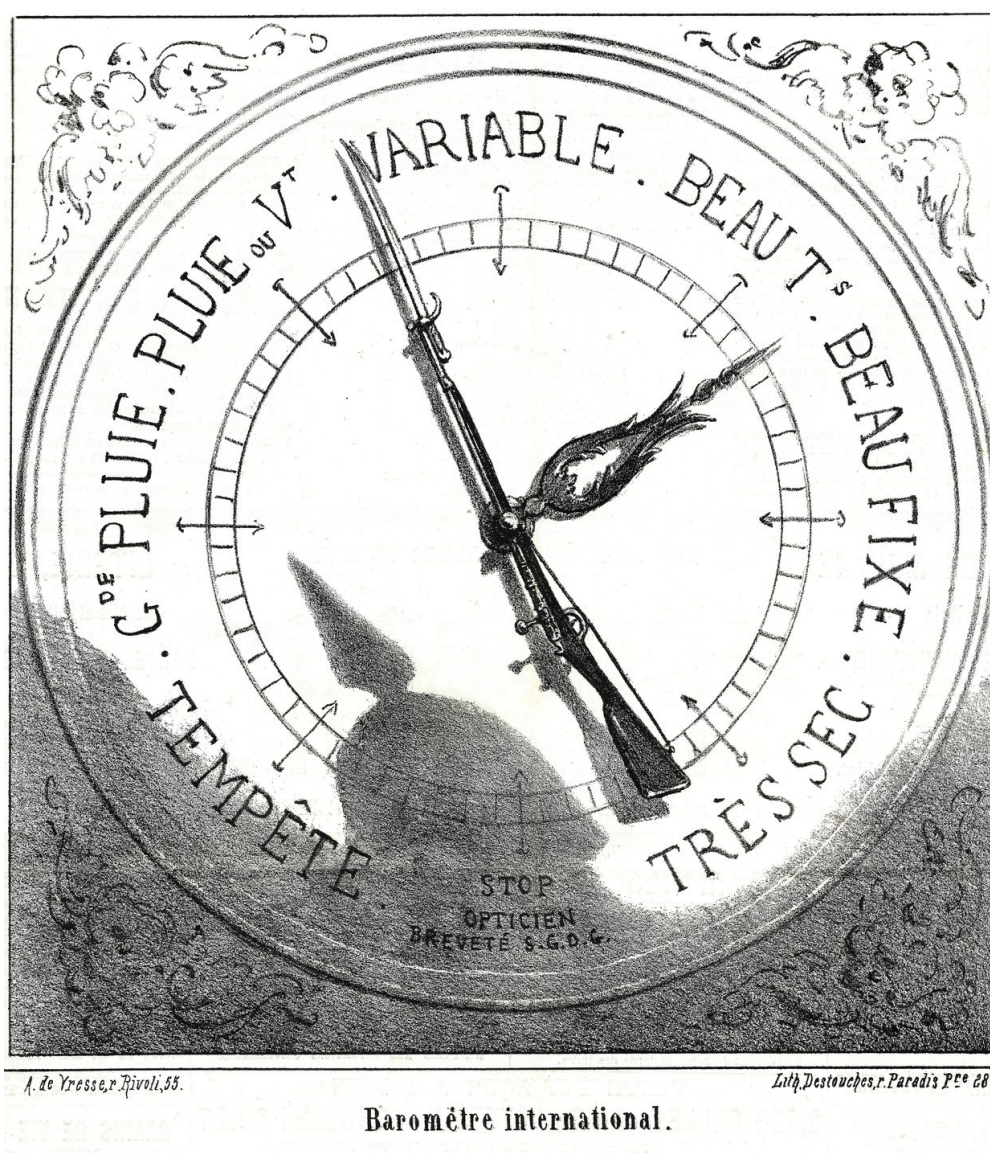
There are several layers of satire here. The first is total surveillance: the police will reach the sky as well. The second is the fashion for instruments: the aneroid was the indispensable accessory of the traveller and the balloonist, and the cartoonist turns a fashionable object into an instrument of control. The third, and deepest, is distrust of the very act of measuring. Scientists measured the invisible — pressure, electricity, the ether — and asserted that the result was objective. To the layman this looked like magic he was invited to take on trust. Hence the logic of the cartoon: today they measure pressure with a barometer, tomorrow speed, the day after that anything at all.

The drawing of 1901 proved prophetic twice over. Surveillance did indeed become ubiquitous — only instead of one flying constable we got cameras and sensors. And distrust of measurement has not gone anywhere: "it sounds scientific, so I shan't argue" and its mirror image "it sounds scientific, so I'm being lied to" are both still in working order, and both draw on the same source.

8. The instrument as political metaphor: *Le Charivari*, 1868

Two generations earlier, and on the other side of the Channel, the barometer had already been pressed into service as a political metaphor — and a far darker one.

On 27 January 1868 the Parisian satirical paper *Le Charivari*, published since 1832 and the source, incidentally, of the London *Punch*'s subtitle, printed a lithograph entitled "Baromètre international". The sheet belongs to the "Actualités" series; the imprint beneath the image — publisher Arnauld de Vresse (55 rue de Rivoli) and lithographer Destouches (28 rue du Paradis-Poissonnière) — matches the *Charivari* sheets of the period, a large share of which were the work of Cham (Amédée de Noé). The attribution is probable but wants checking against the bound volumes.



"Baromètre international". *Le Charivari*, "Actualités" series, 27 January 1868; publisher A. de Vresse, lithographer Destouches. AWIF collection.

The composition works by substituting a single detail. The dial is kept intact and looks like the real thing: around it run the familiar words — *Tempête*, *Gde Pluie*, *Pluie ou Vent*, *Variable*, *Beau Ts*, *Beau Fixe*, *Très Sec* — and even the small arrows between the sectors are in place. But the main pointer has been replaced by a rifle with a fixed bayonet, and the role of the second pointer — the one that on a real barometer records the previous position and shows the trend — is played by the flash of the shot, a tongue of flame and smoke aimed at the sectors for "fair" and "set fair".

The reading is unambiguous. European "pressure" is measured by the gun barrel; the trend of the international weather runs from negotiation towards arms; political clarity arrives only by volley, and that volley is aimed exactly where the nations have been promised peace. The allusion to the arms race of the 1860s is transparent: the French Chassepot against the Prussian Dreyse needle rifle.

The inscription beneath the scale — where the maker's name would stand on a real instrument — reads as a joke in its own right: *STOP — Opticien — Breveté S.G.D.G.* The

word "STOP" in place of a surname mockingly contradicts the movement of the pointer: there will be no stopping. "Opticien" preserves the props of the genre — barometers were indeed sold by opticians. And the formula *breveté sans garantie du gouvernement* ("patented without government guarantee"), which appeared on thousands of French products in the nineteenth century, here sounds like a verdict: the barometer of war is patented, but the government accepts no responsibility for its readings.

And finally the shadow. In the lower part of the sheet the shading resolves into the silhouette of a head in a spiked helmet — the Prussian Pickelhaube. The shadow grows out of the "Storm" sector. Two and a half years later the Franco-Prussian War began.

Thirty-three years and a complete change of register separate these two cartoons. In *Charivari* the instrument becomes a metaphor for war; in *Punch* it becomes an occasion to laugh at measurement itself. But the resemblance matters more than the difference: in both cases a scientific instrument is lifted out of its own domain and dropped into another, and it is that transposition which produces the effect. The donkey barometer does exactly the same thing in reverse: instead of an instrument placed in politics, a tail is placed in meteorology.

9. The donkey's tail in art: the hoax of 1910 and its Russian sequel

The donkey has a parallel line of its own, unrelated to barometers but cut from the same cloth.

On 8 March 1910 the writer Roland Dorgelès, then twenty-four, borrowed a donkey named Lolo from Frédéric Gérard, known as *père Frédé*, proprietor of the Montmartre cabaret Lapin Agile. In the presence of the bailiff Maître Brionne a brush was tied to the donkey's tail; every time it was given a carrot it swished the tail and laid paint on the prepared canvas. The bailiff's presence matters: the hoax was designed from the outset to be documented.

The canvas, 54 × 81 cm — the upper half in orange, yellow and red, the lower half blue — was signed "J R Boronali" and exhibited in Room 22 of the Salon des Indépendants, which opened on 18 March 1910. The author was given as an unknown young Italian painter, a native of Genoa. The public and the critics were also offered a manifesto — the "Manifesto of Excessivism", calling for the ancestral palettes to be smashed and the great principles of tomorrow's painting laid down.

The picture was noticed. Some critics saw genuine modernity in the almost abstract canvas, others just another daub; all agreed that the painter existed. Before long Dorgelès brought the proof to an editorial office — the bailiff's affidavit and a photograph in which a masked company raise their glasses behind a donkey with a brush in its tail.

Some authors move the date of painting to 11 March. The circle of accomplices is named differently in different sources: André Warnod appears almost everywhere, and beyond him, in varying combinations, Jules Depaquit, Genty and Girieud. The publication of the exposure is attributed now to *L'Illustration*, now to *Le Matin*. The sale price in popular retellings is 400 francs, whereas the detailed chronology compiled by the République de

Montmartre gives 250 francs, names the buyer as André Maillos, and adds that Dorgeles passed the proceeds to the orphanage of the arts. Such spread is typical of a story retold for a century for its effect rather than its accuracy.

One detail is frequently confused: Boronali is an anagram not of the donkey's name but of *Aliboron*. That is what La Fontaine and the older French tradition call a donkey in general and, figuratively, a self-assured fool. The donkey itself was called Lolo.

The Russian sequel is well known: the name "Donkey's Tail" was taken by the exhibition that opened on 11 March 1912 in the halls of the Moscow School of Painting, Sculpture and Architecture on Myasnitskaya Street, organised by Mikhail Larionov and Natalia Goncharova. Among the participants were Malevich, Tatlin, Chagall and Le-Dantyu. The group never became a lasting association, but the exhibition was one of the key events in the history of the Russian avant-garde. Significantly, the sense of the borrowing was inverted: in Paris the donkey's tail was an instrument for ridiculing new art; in Moscow it was that art's banner, a challenge to academic tradition. A joke aimed at the avant-garde was picked up by the avant-garde and turned against its opponents.

The connection with barometers is not one of subject but of type. In both cases the donkey's tail serves as a test of authority: meteorological first, artistic afterwards. In the European tradition the donkey is an emblem of stupidity, and that is precisely why it is appointed as the expert. The device is an old one: if a tail does the job no worse than an instrument, and a donkey no worse than a painter, then the problem is not with the donkey.

10. Neighbouring genres: the weather house and the weather friar

Amusing hygrometry is not exhausted by cobalt cards and figurines. It has two close relatives, each of which deserves an essay of its own; they are mentioned here for the sake of completeness.

The weather house (*Wetterhäuschen*) appeared, by the received account, in the mountain regions of Switzerland as early as the seventeenth century, and works on the same hygroscopicity, only mechanically. Inside a miniature chalet two figures stand on a shared platform, and the platform is mounted on a length of catgut which twists or untwists one way or the other as humidity changes, swinging the platform round. In dry air the lady comes out, promising a clear day; in damp air the man with the umbrella appears. In Swiss and German examples the figures are typical burghers in national dress. In American weather houses they are almost always Hansel and Gretel, or the children and the witch, who have taken root in American popular culture rather more firmly than one might expect of a German fairy tale by the Brothers Grimm.

The example in our foundation's collection is a "Chalet House" by the German brand Joggili, from the 1950s or 1960s: thirteen centimetres high, made entirely of wood, with toy fir trees, flower boxes and a tiny cardboard spirit thermometer on the façade graduated in two scales at once, Réaumur and centigrade. The figures here are in national costume and moulded in plastic, but they are carefully made and lose none of their charm. The funniest thing is that the figures have been swapped: it is the lady in her little dress who comes out

with the rain. In all likelihood this is an original factory error, since there are no traces of repair, and it is hard to imagine both figures falling off at once. Which makes the instrument all the more interesting.



Weather house "Chalet House". Joggili, Germany, 1950s-1960s. Wood, plastic, cardboard thermometer in Réaumur and Celsius scales. AWIF collection.

The weather friar (*El Fraile del Tiempo*) is the Spanish line. It was invented in 1894 by the eighteen-year-old Catalan craftsman Agapito Borràs Pedemonte, a native of Calella in the Maresme, who made toys and devices of "recreational physics" for his friends. Inside the cardboard figure of a Franciscan is hidden a natural hygroscopic element; as humidity changes it contracts or lengthens, and a system of balanced levers turns the friar's arm and raises or lowers his hood. The arm points to a scale of seven divisions, from *SECO* through *BUENO* and *INSEGURO* to *LLUVIA*. The composition of the sensing element has never been disclosed by the Borràs family, who call it simply *producto natural*, and a set of legends has grown up around it, from a young woman's hair to horsehair. Production moved to Mataró, closer to Spain's first railway, which gave the object a commercial boost; the family later founded the well-known toy firm Juguetes Borràs, but the hygrometer

stayed outside the corporate mergers and is still assembled by hand by Tot Ideas S.L. under the fourth generation. The example in our collection is a special edition dedicated to the Sagrada Família in Barcelona; the idea is excellent, the printing, alas, lets it down.



"El Fraile del Tiempo" — the weather friar. Tot Ideas S.L., Mataró; edition dedicated to the Sagrada Família. AWIF collection.

Both objects matter to our story for one reason. They show that "recreational meteorology" was not a genre of printed matter but a whole way of handling science: the instrument is made into a figurine, the figurine into a character, and the character into an object of domestic affection. The cobalt postcard and the donkey's tail are simply the flattest and cheapest members of that family.

11. Conclusion

The printed barometer had a short and not especially conspicuous life: roughly from the 1900s to the 1960s, between the invention of cheap colour printing and the arrival of the televised forecast. In that time it managed to split into two branches built on opposite principles.

The cobalt card is an instrument embarrassed to be an instrument. It really does work, its physics is genuine and reproducible, but it is sold as a picture and called a barometer, which it is not. The deception is in the packaging; the contents are honest. The Polish card of around 1930 took the device to its limit: the same cobalt salt was renamed after the decade's most fashionable science and sold as radium.

The donkey barometer is not an instrument and is not embarrassed about it for a second. It does not work as a predictor; it registers consequences, if anything. Its whole construction is a way of saying out loud that the complexity of a forecast is no guarantee of its accuracy. There is no deception here at all: what is stated is exactly what is on offer — hang the tail outside and have a look.

Both branches were born of the same tension. At the turn of the century science began, for the first time, to predict the future daily and publicly — and to be wrong daily and publicly. Society responded not by rejecting science but with irony: a way of keeping one's distance without breaking off relations. The cartoons in *Charivari* and *Punch* display the same mechanism in a higher register: a scientific instrument is lifted out of its domain and dropped into another, and in the gap everything people actually think about that instrument becomes visible.

The mechanism has not gone anywhere. Weather stones stand outside pubs, forecasts still get it wrong, and the formula "it was measured with a complex instrument, so there is nothing to argue about" works as reliably as it did in 1901 — and with the same ambiguity. The only difference is that in place of aneroid barometrical check clocks we now have rather more serious things, and laughing at them is no longer so easy.

From all of which there follows, probably, one practical conclusion. The donkey barometer has not gone out of date because it was never an instrument in the first place: it was always a statement, and statements do not wear out. The cobalt card, by contrast, has gone out of date quite physically — the chemistry moved into industrial indicators, the salt landed on restricted lists, and the very idea of a paper hygrometer on the wall dissolved into an app on a telephone. Which is precisely why it was worth bringing back. A forgotten statement cannot be restored — it is still audible. Only a forgotten object can.

Sources and literature

Archival and reference material

- Library of Congress, Prints and Photographs Division. *Mule Barometer*, 1906. Karen A. Stuart collection of postcards; LC-DIG-ppmsca-67982 / 67983. <https://www.loc.gov/item/2020630131/>
- United States Patent and Trademark Office. *Table of Issue Years and Patent Numbers, 1836 to the Present*. <https://www.uspto.gov/web/offices/ac/ido/oeip/taf/issuyear.pdf>
- Patent and Trademark Resource Center Association. *Early US Patent Data in the United States Serial Set* (yearly number ranges). <https://ptrca.org/files/handouts/HISTPAT2.pdf>
- Punch Cartoon Archive. Charles Harrison, *Increased Activity of the Police. A possibility of the very near future*, 1901. <https://punch.photoshelter.com/image/I0000vFRd3XV66L8>
- Paris Musées / Musée Carnavalet. *Le Charivari* sheets for January 1868: Cham (Amédée de Noé), lithographer P. L. H. Destouches, publisher Arnauld de Vresse. <https://www.parismuseescollections.paris.fr/>
- Wikimedia Commons. *Le Charivari, trente-septième année, vendredi 17 janvier 1868*.

Chemistry and the history of cobalt indicators

- *Hygroscopic Paper* // Scientific American, January 1877 (after the Journal of the Franklin Institute). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6902995/>
- Solomon, M. E. *The use of cobalt salts as indicators of humidity and moisture* // Annals of Applied Biology. 1945. Vol. 32, no. 1. Pp. 75–85. DOI: 10.1111/j.1744-7348.1945.tb06763.x
- *Cobalt(II) chloride* — properties of the hydrates, use as a humidity indicator, IARC group 2B classification and the EEC decision of 15 December 1998. [https://en.wikipedia.org/wiki/Cobalt\(II\)_chloride](https://en.wikipedia.org/wiki/Cobalt(II)_chloride)
- EU REACH Regulation, Annex XVII (restriction on the supply of CMR category 1A/1B substances to the general public); ECHA Candidate List of SVHC.
- Patent literature on humidity indicators: US 2,460,064 / 2,460,065 (P. B. Davis, 1949); US 6,753,184 (cobalt indicating gels, estimate of global consumption).
- Wisniak, J. *Jean Hellot. A pioneer of chemical technology* // Revista CENIC Ciencias Químicas. 2009. Vol. 40, no. 2. Pp. 111–121.
- Henley's *Twentieth Century Book of Recipes, Formulas and Processes* and the French *recettes et procédés* compendia — sources for historical formulations of hygroscopic compounds.
- *Humidity indicator* (cobalt impregnation of paper, Cracker Jack premiums) — Bizarre Labs, reproduced in teaching material of the University of Iowa. <https://instructional-resources.physics.uiowa.edu/>

Donkey barometers, weather rocks, publishers

- *Weather rock* — definition, the canonical list of readings, the "famous Maine weather stone" of the Audubon camp on Hog Island (1981). https://en.wikipedia.org/wiki/Weather_rock
- *Donald McGill* (1875–1962) — biography, the beginning of his work with the Pictorial Postcard Company in 1904. https://en.wikipedia.org/wiki/Donald_McGill
- Littlehampton Museum. Collection of postcards and original works by Donald McGill. <https://www.littlehamptonmuseum.co.uk/>
- Donald McGill Museum, Ryde, Isle of Wight. <https://saucyseasidepostcards.com/>
- Central Brass Manufacturing Company (founded 1895, Cleveland, Ohio; now part of Pioneer Industries). <https://pioneerind.com/central-brass-home/>

- Material on the "Kufsteiner Batzenhäusl" / "Weinstube Schicketanz", Kufstein, Tyrol (postcard editions of the 1930s–1970s).

Boronali and the Donkey's Tail

- *Et le soleil s'endormit sur l'Adriatique* — circumstances of the hoax of 8 March 1910, Room 22 of the Salon des Indépendants, the "Manifesto of Excessivism".
https://en.wikipedia.org/wiki/Et_le_soleil_s%27endormit_sur_l%27Adriatique
- République de Montmartre. Chronology of the painting: sale for 250 francs to André Maillos, the proceeds given to the orphanage, and the later history of the canvas (Espace Culturel Paul Bédou, Milly-la-Forêt). https://www.republique-de-montmartre.com/detail_168.html
- *Donkey's Tail* (artists' group) — exhibition of 11 March 1912, Moscow School of Painting, Sculpture and Architecture, 21 Myasnitskaya Street.
https://ru.wikipedia.org/wiki/Ослиный_хвост
- Encyclopaedia of the Russian Avant-Garde. "Donkey's Tail": participants, catalogue of the 1912 exhibition. <https://rusavangard.ru/online/history/oslinyy-khvost/>