# BACK FOCUS

**The Journal of the Australian Photographic Collectors Society (Inc)**

Incorporation Registration No. A16888V ABN 55 567 464974

**Issue No. 77** **June, 2010**


*New world record set at auction in Vienna with an original 1839 "Giroux Daguerréotype".*
*~ Million Dollar price barrier broken! ~*

*Guest speaker at our April meeting, Gerhard Liedtke with part of his display.*


*The Most Common Brownies presented by (who else) Lyle Curr.*

*Join Peter Jensen on a fascinating trip through a Swiss Photographic Museum.*

# THE AUSTRALIAN PHOTOGRAPHIC COLLECTORS SOCIETY Inc.

**Incorporation Reg. No. A16888V ABN 55 567 464 974**



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## Notes from the desk of the Editor:

As I start compiling this issue, it is tremendously satisfying to have such a good store of copy to choose from. In many of the journals we receive from counter mailings, I read of the woes of others in my position as they plead for copy to get out a single issue. The amount of input we receive is not only good, but the quality both of content and photographs is as good as anything that passes through my hands. However, that is not in anyway to deride the many excellent journals we receive from overseas societies. These are held, along with our library, in our cupboard at the MRH and I would strongly recommend members to have a look through these at meetings.


The issue shown of 'The Journal' (Photographic Historical Society of New England Inc) has a great article on 'The Amazing Saga of the World's First Photograph' and I always welcome the arrival of Photographic Canadiana, among many others. **Ian Carron.**

**Index to this issue:**

# A Rare Lens: the Micro-Nikkor 70 mm f5.

**Alan Elliott**

Some twenty years ago I spotted an unusual lens in the second-hand window of a Melbourne photographic dealer. The 70 mm f5 Micro-Nikkor with an L39 screw thread mounting and no helicoid was new to me. Why did this Micro-Nikkor look like an EL-Nikkor – and why that strange focal length and aperture? All the dealer could tell me about it was that it was amongst a miscellaneous lot of photographic gear purchased from a government department. He suggested that it might have been used in a movie film copier. The lens seemed to be in excellent condition and the price was reasonable. To a Nikon collector with a fascination with lenses this was irresistible. **(Photo 1)**


The lens is obviously well made, and at 240 g quite heavy for its size, indicating an all-brass mount. It has a scalloped aperture ring, similar to Nikkors of the 1960s. The absence of a focusing helicoid suggested that it was intended for use on a bellows or possibly in some unknown fixed equipment. The marking is Nippon Kogaku Japan, and the serial number is 705125. (Note 1)

A search of my Nikon catalogues yielded nothing at all. To test it I made an L-F adaptor to fit the Nikon PB6 bellows and experimented with copying slides onto 35mm film. However, in comparison with the 55 mm f2.8 Micro Nikkor the set-up was clumsy and the results no better. I put the lens back into the collection as an interesting but impractical curiosity, hoping some day to find out more about it. When the internet became available I made occasional checks and found that there were a few in private collections but little technical information came to light. Recently I tried again and found new websites, which give the background to the lens design, some technical data and the results of practical tests. My strange Micro-Nikkor turned out to be a far more interesting item than I had imagined. The following is abstracted and condensed from Michio Akiyama and Enrico Savazzi's fascinating websites.

The Micro-Nikkor 70 mm f5 was produced in the early and mid-1960s by Nippon Kogaku in a relatively small number, perhaps not exceeding 500. The lens was designed primarily for microfilming documents. Microfilm cameras imported into Japan from the USA were found to be unsatisfactory because lenses designed in the West, although adequate for copying material printed in Western alphabets had insufficient resolution to reproduce the complicated Japanese kanji characters. In the mid-1950s Nippon Kogaku entrusted the design work for a new lens to Zenji Wakimoto. His efforts were extremely successful. (Note 2) The development of such a high-resolution lens was difficult. After the design was finalized, bringing the lens into production was a challenge. Particular attention was given to the selection of the optical glass. Craftsmen hand-ground the aspherical surfaces, frequently checking the optical performance with a precision testing instrument also made by Nikon. Finally, each lens had to pass a rigid QC test before being stored along with its signed acceptance certificate in a sturdy wooden box lined with red velvet. Subsequently, the technology was refined to produce the first Ultra-Micro Nikkor lenses used to print the photomasks for early integrated circuits.

The front element of the lens is about 30 mm in diameter, almost enough for a maximum aperture of f2.8, yet the aperture ring opens only to f5 and there is a fixed stop immediately at the rear of the diaphragm which also limits the aperture to f5. This construction virtually eliminates light fall-off at the edges of the picture. A black ring at the rear of the lens unscrews to reveal a double adjustment ring used to finely calibrate and lock the rear element during factory adjustment. This is a feature rarely found in consumer lenses and is reserved for high-end optics. No official Nikon documentation has been found and the construction details are sketchy. The principal technical data reported on websites are:

- Construction: 5 elements in 4 groups.
- Standard (optimum) magnification 1:12
- Usable magnification range: 1:30 to 1:5.
- Image area 32 x 45 mm.
- Resolution 125 lines (or, more probably, line pairs) per mm.
- Corrected chromatic aberration range 400 to 650 nm.

Enrico carried out a series of tests and came to the conclusion that within its optimum range the resolution of his example peaked at f8 with a very slight drop at f11, which he attributed to diffraction effects. The wavelength range over which chromatic aberration is corrected shows that the lens is close to apochromatic.

Thus, the 70 mm Micro-Nikkor lens was designed specifically for copying office-size documents onto 35 mm film. In my tests I was copying 35 mm slides at 1 to 1 magnification. This was way out of the optimum performance parameters of the lens. No wonder my results were no sharper than a regular consumer Micro-Nikkor.

I decided to make another test. However, even with the PB6 bellows at minimum extension the lens was still outside the design range, so I adopted a fixed focus arrangement instead. Fitting an E2 ring and the L-F adaptor to a Nikon D50 brought the magnification factor into the usable range. However, even with the camera attached to the PG2 focusing unit, exact focus was difficult to find. I made a series of test shots at 1 cm increments until the images when viewed on the monitor showed that correct focus had been achieved. At this point the distance from the front of the lens to the subject was 51 cm. Exposure was in manual mode by flash on an extension cord. The resulting images are impressively sharp. **(Photo 2)**

Unfortunately the wooden box the lens originally came in is missing. (Note 3). Clearly, within its design range this is an outstanding lens even by modern standards, and almost certainly exceeds the capabilities of existing 35 mm digital sensors.

**Note 1.** The serial number consists of 705 followed by three more digits, probably starting with 001.
**Note 2.** In 1965 Mr Wakimoto was awarded the Japan Science and Technology Medal with Purple Ribbon for outstanding work in lens design.
**Note 3.** Each box was marked with the serial number of the lens but few boxes are known to have survived. It is ironical that the boxes might now more valuable than the lenses.

# MORE THINGS SWISS

Peter Jensen

Back Focus issue 74 and the article on the Lichtensteig photo antiques and camera fair inspired me to relate another superb Swiss photographic event.

In April 2009 I was extremely fortunate to have a business trip to Europe, which extended nicely into the once in a lifetime overseas family holiday. More fortunate indeed was that my brother-in-law lives in Lausanne and offered to lodge and feed us in his multi story apartment with views over Lake Geneva and the French Alps. Life can be very hard at times!

A quick web search turned up several photographic related museums in Switzerland but the one that stood out was the Musee suisse de l'appareil photographique Vevey.

Vevey is a small village on the shores of Lake Geneva and only 20 minutes by train from Lausanne. The train trip alone with the lake and Alps to one side, and small family vineyards clinging to impossible terraces on steep mountainside on the other, is well worth the ticket. On arrival in Vevey one meanders down the hill from the train station to the town square (la Grande Place) to be greeted by even grander views across the lake to the alps. Here is situated the Swiss Photographic Museum.


In 1971 Vevey hosted a significant retrospective exhibition of photographic history to celebrate the collection of Michel Auer. This proved so successful that the idea of a permanent exhibition in the form of a museum was floated and in 1979 Claude-Henri Forney opened the Musee suisse de l'appareil photographique. The original site of the museum was in the next street but connected via an underground passageway to an historic building on the square, which became the current museum site in 1989.

The prime objective of the museum is the conservation of various technological items, which are not only part of heritage, but which demonstrate the origins and history of photography and hint at its future evolution. With this in mind, the museum has been brilliantly designed over six levels progressing from the earliest to the latest in photography, and is full of not only static displays but many audio-visual and interactive devices. To assist the poor uni-lingual amongst us, an audio guide in several languages is included in the modest admission fee. Unfortunately my high school French was not sufficient to fully interpret the information provided.

From the time one enters the building the experience is amazing. The first display in an operating camera obscura looking out into la Grande Place and at the Chateau de l'Aile. What a brilliant way to introduce the visitor to the phenomenon, which led to the birth of photography. From there the visitor moves to the first of the six levels in the building, each level being dedicated to a set period of photographic history or to specialised temporary exhibitions. The plethora of equipment and information was mind boggling and in my three hour visit (not long enough) I often found myself retracing my steps to review a special item or to clarify some incidental piece of information.

The progression from the earliest methodology of Niepce to Daguerre and Fox Talbot flowed seamlessly through the exhibitions, as one followed the development of wet plates and dry plates, and of course Eastman's "You press the button, we do the rest" technology, to 35 mm film. As one wandered through the eras of film advances, magnificent brass and mahogany studio cameras and the associated clamps and supports to stop sitter movement during plate exposure, a superb Leica display and even a photojournalism section, it was impossible not to relive the history.

Apart from the static displays there were extremely well devised audiovisual and interactive sections, which could have taken a full day by themselves to work through. These included a working darkroom, videos on making Daguerreotypes, a working studio from 1850, ongoing movies from the various eras, and the chance to view hundreds of early photographs, all beautifully catalogued into modern computer technology.

As I left the museum, unfortunately far too soon due to the need to catch another train to meet the family for a further tourist opportunity, I was even invited to attend several workshops and tours, which the museum regularly conducts. Not only could I have participated in a digital photography class or a group tour, I could undertake a dark room session, learn how to make Daguerreotypes or send my children on a field trip with a professional photographer to learn about the magic of photography (film of course). One could not help but be inspired by the dedication and commitment that made this a truly wonderful museum.

I did manage to drag myself away in time to catch the train to Geneva, but even though I rued the lack of time in Vevey I did stumble upon a delightful antique shop/museum in Geneva. "Antiquities Scientifiques" was full of cameras, microscopes, optical equipment and fantastic other treasures but that's another time and another story.

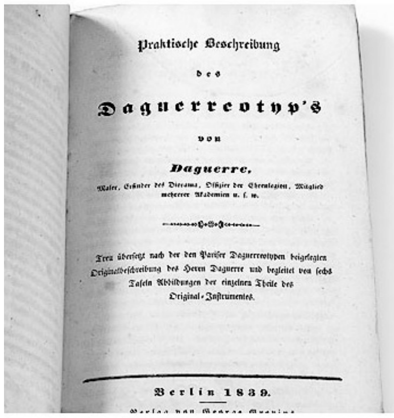
# Sensational Find Of An Original Daguerréotype!

The “Giroux Daguerréotype” is the first commercially-produced camera in the world and represents the initial spark that began the worldwide spread of photography. It was made in Paris from 1839 in limited numbers from original plans drawn up by its inventor, Louis Jacques Mandé Daguerre, by his brother-in-law, Alphones Giroux.

***Peter Coeln of WestLicht Auctions with the “Giroux Daguerréotype” camera.***

The camera being auctioned on the 29th of May by WestLicht Auctions in Vienna was completely unknown and has never before been documented. It has been in private ownership in northern Germany for generations. The present owner’s father gave it to him in the 1970s as a present for passing his final apprenticeship test as an optician.

***Lens of the camera.***




***Original Instructions.***

The outstanding original condition of the 170 year-old apparatus is remarkable. Every detail including the lens, the plaque signed by Daguerre himself, the black velvet interior and the ground-glass screen are in their original state.

The unique camera comes with the extremely rare original instructions in German with the title: “Praktische Beschreibung des Daguerreotyp’s”; published by Georg Gropius, Berlin 1839, 12x20cm, 24 pages with 18 illustrations in 5 plates showing the equipment used for producing Daguerreotypes in accordance with Daguerre’s invention. On the back of the little book there are two handwritten notes from 1840 with details of the process.


***Nameplate detail.***

The expertise has been written by Michel Auer, the internationally renowned expert on historic cameras and author of numerous books. Worldwide, only a few of these cameras are known to exist and all of those are in public museums. A camera like this has never been offered for sale by auction before. It is anticipated that WestLicht Auctions’ own world record price of 576,000 Euros (also for a camera from 1839), will be significantly exceeded. The starting price is €200,000, the estimate €500,000 – 700,000.

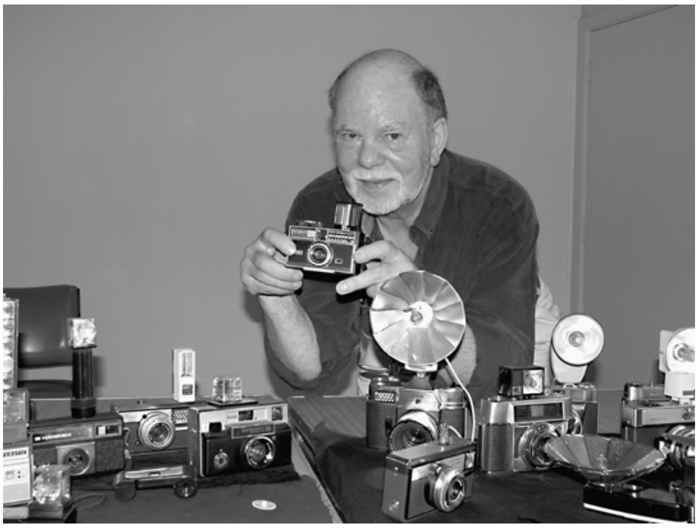
**Footnote:** Selling for €610,000 plus buyer premium (€732,000 total) or, in Australian dollars, a grand total, including premium of **$1,060,160** this camera became not only the oldest but also the most expensive camera in the world.

*With appreciation to Peter Coeln and WestLicht Auctions for permission to reprint the above.*

# April Meeting

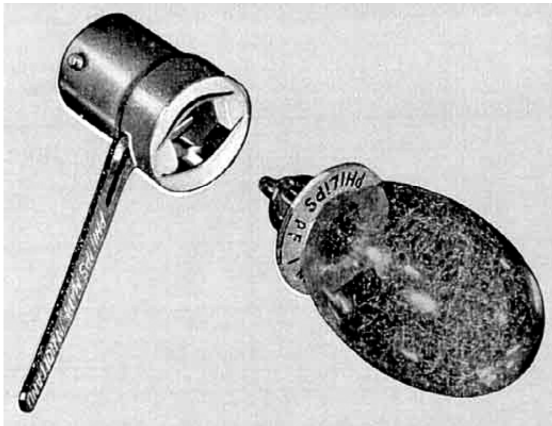
**Report & Photos, Ian Carron.**

Possibly due to the exceptionally sunny day, our meeting numbers were down a little on the usual. However, at 9am when the committee arrived for a committee-meeting prior to the general meeting, the old adage of 'when in doubt, run in circles, scream and shout' well and truly applied! Margaret had been supplied with a new security key to the front gate and we found it wouldn't fit the padlock and we couldn't get in! Finally, we did find it opened the padlock on the side gate and gained access via the side doors. A frantic phone call to a Model Railway Club member brought a hurried response and a change of key.



*Guest speaker Gerhard Liedtke holding his Instamatic 400.*

We were then able to hold the committee meeting, solve all the problems of the world and get all the Back Focus #76 issues stuffed ready for the mail out.



***The machining of this 'simple' PF1 adaptor during his apprenticeship was a labour of love, blood, sweat and tears!***

***Samples from Gerhard's talk, above and right, were passed around for inspection.***

The meeting itself started on time and our guest member speaker was Gerhard Liedtke. Gerhard was speaking on a "History of Flash" but in fact his talk was as much a history of his time and experiences in the photographic industry, both in his homeland and here in Australia and, as such, was thoroughly fascinating. An instrument maker by trade, he particularly had some very interesting stories about his early days and apprenticeship in Germany. His little story alone on machining up the PF1 flash adaptor I found engrossing. One thing, which I think was made obvious, is that many of our members, like Gerhard, must have extremely interesting backgrounds that make for a first-rate talk at a meeting.

After coming to Australia he worked for some time with Kodak and, a modification suggestion he made to improve reliability on the motor drive of the Instamatic 400 earned him a nice bonus.

# Radioactivity and the yellow color cast in old lenses

**Paul I Boon**


***Canon FtbN and (below) the Canon FDN 35mm f2.***

One of the earliest lenses I bought was a Canon FD 35mm *f* 2.0, to go with my then-new Canon FtbN in the mid 1970s. It was one of the first in Canon's series of fast FD lenses, and had the concave front element and chrome filter-retaining ring. Sadly, within a couple of years the lens developed a strong yellow cast and proved useless for color photography, although it remained fabulous for black and white as long as you used the through-the-lens meter. It was eventually replaced with a 35mm *f* 3.5 'silver front' lens (as these early-FD lenses with the chrome front ring came to be known) with no color cast and, when this lens proved too slow for use in ambient light, a FDN 35mm *f*2.0 (i.e. the FD 'New' version, with Canon's nasty quasi-bayonet replacement of the original breech-lock lens-mounting mechanism).


I thought little of the color cast in the old Canon lens until I bought, for reasons that now seem less than clear, a Minolta XE-1 at a recent APCS market. Having got the body, I was then pathetically committed to collecting a set of the 'useful' lenses to go with it: in my case, this means those Rokkors with focal lengths between 24mm and 200mm. A 28mm *f*2.5 lens turned up soon enough and I duly bought it. The camera shop was dimly lit so I couldn't inspect the lens as well as I would have liked, but the external cosmetics were perfect, the iris shut down quickly then opened up again just as fast, fungus was not evident, and the front and rear elements were scratch-free. I duly paid the small amount asked. Once I got it home though, I noticed that, like the old Canon FD 35mm *f*2.0, the 28mm Rokkor had a strong yellow color cast. This got me a-thinking: why did these particular lenses develop this color? (Perhaps the color cast also explained, or at least justified, the Minolta lens' relatively low price…)

After some delving in the Web, I saw that two reasons had been proposed to account for the development of a yellowish color cast in old lenses: i) degradation of the balsam-based glue used to cement lens doublets; and ii) use of radioactive elements in the composition of individual lens elements. Two radioactive elements were listed as the main culprits: Lanthanum and Thorium. In a past job, I was radiation safety officer in a research laboratory that routinely used isotopes such as $^{3}H$, $^{14}C$ and $^{32}P$, and I had kept my old texts on the subject of radioactivity and radiation safety. My interest was pricked: hence this article.

**Why use Thorium or Lanthanum in lenses?**

There are two main reasons why Thorium or Lanthanum might be found in photographic lenses.
The first is their deliberate inclusion in the bulk mix of the optical glass to produce glasses with high refractive index but low dispersion. Such characteristics are very helpful when designing lenses, especially high-speed, wide-angle ones, as Thorium and Lanthanum increase the refractive index of the glass and allow individual components to be made thinner and lighter. In both cases, it is the oxides that are used in a homogeneous glass mix. As an example of the deliberate inclusion of

Thorium and Lanthanum, one patent for optical glass issued in 1939, referred to in an article by Oak Ridge Associated Universities, showed a composition of Boron (36%), Lanthanum (12%), Thorium (12%), Barium (20%) and Calcium (20%). In this case, it's clear that both radioactive elements were a deliberate inclusion to improve the optical quality of the glass (see http://www.orau.org/PTP/collection/consumer%20products/cameralens.htm). Another article pointed out that many lenses contain Lanthanum, as Lanthanum crown glasses were developed in the mid 1930s and then widely applied by Kodak in their Tessar-type lenses. In fact, the lens descriptor *Lanthar* was coined to reflect the inclusion of Lanthanum in the glass mix, and Lanthanum trioxide ($La_2O_3$) is still a critical component in many high-refractive index glasses.

The second explanation is the accidental inclusion of radioactive materials during the melting of the optical glasses; in other words, they are unwanted contaminants. The contaminants could have been introduced either with the raw material used to make the glass or as 'leftovers' from purification processes subsequently used to bleach it. As an example of the latter, Cerium was long used to bleach iron salts to their colorless ferrate form, and the purity of the Cerium first used was rather questionable (http://www.prairienet.org/b-wallen/BN_photo/lostsites_Monaghanradioactive.htm).

Aside from these two main causes, radioactivity might be present in optical lenses because of a range of other, less common, reasons. Some lenses might be radioactive because of the inclusion of radium-containing radioluminescent markers, but this is probably unlikely for items designed for consumer use. Thorium fluoride can be used to coat germanium lenses (http://photo.net/medium-format-photography-forum/009X3q). Various rare-earth elements, some of which are radioactive, have been used in color-enhancing filters to change their color-transmission curves (http://www.prairienet.org/b-wallen/BN_photo/lostsites_Monaghanradioactive.htm). Finally, it may be possible for photographic equipment to be contaminated with radioactive waste, e.g. as army-surplus items from the 1950s when many above-ground atomic tests were conducted, or perhaps even as ex-Soviet lens from the Chernobyl accident in the Ukraine. An American article on radioactive lenses recently discussed the possibility of consumers inadvertently buying lightly contaminated lenses from the US military
(see http://www.prairienet.org/b-wallen/BN_photo/lostsites_Monaghanradioactive.htm).

My article is concerned only with the two main causes in this host of possible explanations. (But for an intriguing account of how radioactively contaminated items may be left around for years after atomic tests, read the alarming account of the Maralinga atomic tests in South Australia by Alan Parkinson: *Maralinga: Australia's nuclear waste cover-up*, ABC Books, 2007.) If the first general explanation holds, the content of Thorium or Lanthanum (and thus radioactivity) should be appreciable in a single lens and relatively constant over a given series of lenses of the same make. If the latter explanation holds, however, the radioactivity should be lower and more variable, according to the intensity of the contamination. Moreover, the radioactivity in a long-running series of lenses may well decrease towards the end of the lens cycle (i.e. in those with higher serial numbers) as improved methods for purifying the raw material were gradually introduced.

**A primer on radioactivity**

Radiation surrounds us; we eat it in our food (e.g. from the Potassium-40 in bananas, nuts and beans), we are exposed to it in our houses (e.g. from concrete in the exterior walls, gypsum in the plaster-board walls, granite in the kitchen bench, and from Radon-222 diffusing up from the soil and accumulating in the sub-floor space in poorly ventilated houses) and we are often exposed to it during medical procedures (e.g. X rays and other forms of nuclear scanning).

There are three types of nuclear radiation: $\alpha$, $\beta$ and $\gamma$ radiation. The first – alpha ($\alpha$) radiation – is caused by Helium nuclei and is commonly emitted by radioactive elements such as Uranium and Thorium. Since Helium atoms are pretty big (well, in sub-atomic terms at least), alpha radiation is easily stopped by a few centimeters of air or even a few sheets of paper. It, however, poses a significant health risk as, if ingested (e.g. in food or in tobacco smoke), $\alpha$ particles are so energetic that they crash violently into cells and cause substantial genetic damage. Mutation and cancer often result. Beta ($\beta$) radiation is caused by fast-moving electrons that originate in the atomic nucleus. These particles are more penetrating than $\alpha$ particles but, being much smaller, generally cause less cellular damage to living tissue. Nevertheless, they also may be responsible for mutation and carcinogenesis. A few centimeters of metal will stop $\beta$ radiation, as will about 3 m of air. Gamma ($\gamma$) rays are electromagnetic waves, similar to light and radio waves, but at a much shorter wavelength and thus a much higher energy. Accordingly, they are highly penetrating and can pass through metres of solid material such as concrete. X rays are similar to gamma rays, but is the term used to describe gamma emissions produced when an electron strikes a material and causes atomic electrons to change their orbit. Thus X rays could be produced when $\beta$ particles strike a metal surface and quickly decelerate: this type of radiation is known as *bremsstrahlung* (or 'breaking radiation'). That's why, sometimes, a thin plate of perspex is a better guard against radiation than a thick panel of lead.

There are three sources of radiation on Earth. First, some radiation is primordial and the radioactive elements were created during the first few moments of the Big Bang, when the universe was formed. The primordial elements that still exist and are radioactive must have very long half-lives, otherwise they would have decayed to nothing over the billions-of-years-long history of the universe. Examples of primordial radioisotopes are Uranium-235, Uranium-238, Thorium-232, Radium-226, Radon-222 and Potassium-40. What's relevant to photographers here is that the old Uranium-containing toners of the 1940s were undoubtedly quite radioactive. And, of course, our old friend Thorium-232 is a primordial element. Second, some radiation is produced as the result of cosmic rays from outer space interacting with atoms in the atmosphere. Carbon-14 and H-3 are examples of radioactive elements produced by cosmic rays in this way. Third, some radiation is produced artificially by humans, during atomic-bomb tests, or as leakage from nuclear reactors, or as medical products or waste. Examples include Iodine-131 and Iodine-129, Cesium-137, Strontium-90 and Plutonium-239. Many of these elements are produced during the fission of atomic weapons, so we have an enduring legacy of radioactive contamination around the world, courtesy of the hundreds of above-ground tests undertaken during the Cold War.

Of the two radioactive elements commonly found in photographic lenses, Thorium-232 undoubtedly presents more of a problem for photographers since Lanthanum is only mildly radioactive, emits only $\beta$ particles, and has a very long half life ($100 \times 10^9$ years). Of the dozens of Lanthanum isotopes, only two are radioactive and the one most commonly found (Lanthanum-138) accounts for only 0.09% of the total. In contrast, all naturally occurring Thorium is of the radioactive isotope Thorium-232 and it (and through its daughter products) emits almost every sort of ionizing radiation during its decay through various atomic states to the final product, Lead-208. Alpha particles and beta particles are emitted as Thorium decays to these other radioactive daughters, some of which remain temporarily in excited states until they decay further to a more stable state by emitting gamma rays as well. Moreover, X rays can be emitted as the electrons re-arrange themselves during radioactive decay of these unstable forms. In other words, the inclusion of Thorium in a photographic lens can give rise to a host of radioactive emissions. Eventually, the Thorium decays to the stable (and therefore non-radioactive) Lead-208, but the half-life for this to occur is $14 \times 10^9$ years.

The link between radiation and the development of a color cast in a lens is that the charged alpha and beta particles emitted when Thorium decays misplace electrons from other molecules in the glass. Since glass is an insulator, other electrons cannot move to replace these displaced electrons, and a color centre is rapidly formed where the electron has been displaced but not replaced. The explanation is given by Theodore Gray at http://www.periodictable.com/items/090.5/index.html.

**What sorts of lenses are radioactive?**

The trawl through the Web came up with a range of lenses that are known to be radioactive. The most commonly reported were the Aero-Ektars of Kodak, which were made for aerial reconnaissance during World War II. An article on these lenses by Michael Briggs (http://home.earthlink.net?~michaelbriggs?aeroektar?aeroektar.html) reported that radiation fingerprinting showed conclusively that the emissions were due to the inclusion of Thorium-232 – and its daughter product, Thallium-208 – in the inner two lens elements. The Aero-Ektars are known to discolor to a strong brownish tint with age. Briggs argued conclusively that Lanthanum was not the cause of either the measured radioactivity or the color cast in the Aero-Ektars; the radiation fingerprinting showed it to be due to Thorium and its daughters, and the inclusion of Thorium in the internal elements was a patented and intentional design aspect to obtain glasses with the desired optical characteristics.

*A Kodak Aero Ektar.*

Other lenses identified as radioactive during the Web search included the Canon FL 58mm *f* 1.2; Kodak Ektanar 38mm *f* 2.8, Ektanon 46mm *f* 3.5 and 50mm *f* 3.9; Pentax SMC Takumar 50mm *f* 1.4 and Macro-Takumar 50mm *f* 4; Pentax Super Takumar 35mm *f* 2.0, 50mm *f* 1.5 and 55mm *f* 2.0; Pentax Takumar 6x7 105mm *f* 2.4; and Yashica Yashinon-DS 50mm *f* 1.7. Other sources listed a range of radioactive Kodak lenses, including the Ektar 101mm *f* 4.5 (1946), Ektar 38mm *f* 2.8 (1968-1970), Ektanar 50mm *f* 2.8 (1958-1962), Ektanar 90mm *f* 2.8 (1958-1962), Ektanar 44mm *f* 2.8 (1957-1962), Ektanon 46mm *f* 3.5 (1956-1959), Anastar 44mm *f* 3.5, and Kodak Color Printing Ektar 96mm *f* 4.5 (1963) (see http://www.camerapedia.org/wiki/radioactive_lenses). This source identified also the early Canon FD 35mm *f* 2.0, GAF Anscomatic 38mm *f* 2.8, Kodak Ektanon 50mm *f* 3.9 and Nikkor 35mm *f* 1.4 (early version) as radioactive. Interestingly, it argued that two Minolta lenses (MC W Rokkor-SI 28mm *f* 2.5 and MC Rokkor-PG 58mm *f* 1.2) were radioactive because of the presence of small amounts of radioactive contaminants, rather than being radioactive as a direct result of the deliberate inclusion of Thorium or Lanthanum. One article identified the Leica 35mm *f* 2 Summicron as radioactive, but did not further specify which version was affected (http://www.prairienet.org/b-wallen/BN_photo/lostsites_Monaghanradioactive.htm). I see, however, that Erwin Puts made no reference to radioactive elements in any version of this lens in his magnificent *Leica lens compendium* of 2001.

*Olympus f1.2/55mm.*

The 50mm f1.5 Nokton in the Voigtländer Prominent is reported to be radioactive, as are some Apo-Lanthars, the Carl Zeiss Jena 50mm Pancolar in both *f* 2 and *f* 1.8 forms, Carl Zeiss Jena 20mm Flektagon. Early models of the Olympus 55mm *f* 1.2 Zuiko lens are also reported to be mildly radioactive, as well as the Vivitar 35mm *f*1.9 (http://www.prairienet.org/b-wallen/BN_photo/lostsites_Monaghanradioactive.htm). One report mentioned the Schneider 75mm *f* 3.5 Xenotar fitted to the Rollieflex as containing Thorium and, therefore, possibly being radioactive. The pre-AI version of the Nikkor 35mm f 1.4 lens is reported to contain Thorium (http://www.photo.net/bboard/q-and-a-fetch-msg?msg_id=0054IM). Finally, one source indicated that some Nikon enlarger lenses were radioactive (http://www.radlab.nl/radsafe/archives/9803/msg00137.html). I note that two articles, both by Frydman and Wright, appeared in the *British Journal of Photography* in 1987 on radioactive lenses, but I've not been able to obtain copies of either.

**My own tests**

A simple, but only semi-quantitative, way of testing whether a lens is radioactive is to place it on a piece of film (e.g. Polaroid 3000) for a week and look for a fogged image. Somewhat ironically, this is the very same approach that allowed the Curies to identify radioactivity in the first place in the late 19th Century: a small piece of radium was inadvertently left in a draw near a photographic plate and the plate was later found to be fogged. A better way, however, is to use a modern instrument designed to measure radiation.

*The Mini-Instruments Model 900 used for testing.*

I still have access to a laboratory used for biological experiments with radioactive isotopes, so I borrowed a Geiger-Műller (G-M) counter for a few days to test the lenses in my collection, as well as any others that I could easily get for an afternoon of testing. The G-M counter was a Mini-Instruments Model 900 (Burnham-on-Crouch, Essex) with a EP15 M detector. It had been recently (1 April 2009) calibrated at Australian Radiation Services (Blackburn, Victoria). A G-M counter is ideal for the task, as the correct version can detect α, β and γ radiation. I measured the radioactivity of a suite of lenses at the rear (level with the mounting flange) and at the front (level with the external body of the lens' filter-retaining screw). In some cases I measured also the radioactivity at known distances from the rear flange and, in one case, at the film gate of a camera with a radioactive lens mounted at the front on the body. The results are shown in Table 1. The units are counts per second (cps).


*Rokkor PG 58mm f1.2*

The survey showed that six lenses exhibited radiation markedly above background levels: one Canon, one Konica, one Minolta, two Pentaxes, and one medium-format Carl Zeiss Jena. In all but two cases – both Pentax SMCs – all the radioactive lenses were either fast (for their time) wide-angles (Canon, Minolta, Carl Zeiss Jena) or a fast standard lens (Konica). One of the radioactive Pentaxes was a macro lens. The measured radioactivity ranged up to ~300 cps for the Konica and Pentax; by way of comparison, one Web article I found reported radioactivity of up to 850 cps for the Aero-Ektars.
(http://www.prairienet.org/b-wallen/BN_photo/lostsites_Monaghanradioactive.htm).

There was no simple relationship between the development of a yellow color cast in a lens and measurable external radioactivity. The old Canon and Minolta lenses that prompted the test were both yellow (extremely so in the case of the Canon) and, to various extents, radioactive. The more modern Konica *f* 1.4 lens had a mild color cast too but was markedly radioactive. Conversely, however, the 50mm Flektagon was slightly radioactive but had glass that was clear as a bell. The Pentax SMC macro lens was radioactive and, like the Flektagon, did not have any color cast. And the mighty old Minolta MC Rokkor PG 58mm *f* 1.2 was going obviously yellow, but showed no evidence of radiation at all.

To confuse matters even more, one of the most radioactive lenses was the Pentax SMC Takumar 55mm *f* 2 (Lens C) but it had no color cast. Other examples of this lens formulation were not radioactive and also utterly clear (Lenses A and B). In fact, what was revealed by the test of three 55mm *f* 2 Pentax SMC Takumar lenses was that not all models of apparently the same type were radioactive. In the case of these Pentax lenses, the non-radioactive Lens A was the standard early model with white lettering. Of the two later 55mm *f* 2 Pentax lenses with yellow lettering denoting the focal length and aperture, one was radioactive (Lens C) but the other was not (Lens B). Both lacked any color cast. The 55mm *f* 1.8 Pentax lens also was not radioactive. One Web article I found picked up on this within-brand variability, and reported that only the first version of the Pentax SMC 50mm *f* 4 Macro-Takumar was radioactive and that the later version (with the rubber focusing ring, rather than the earlier turned metal ring) was free of Thorium and, I presume, was not radioactive.

*Pentax Macro Takumar f4/50mm.*

The next question to answer was how far the radiation penetrated beyond the lens. In the case of the Pentax 50mm *f* 4 macro lens, the radiation decreased from ~20 counts per second (cps) from the front filter-retaining screw without a lens cap to ~8 cps when the original Pentax metal lens cap was attached. The metal cap clearly intercepted some of the radiation.

To see how far radiation would penetrate through the air in the absence of a lens cap, I measured it at various distances from the rear lens-mounting flange of the radioactive Canon 35mm *f* 2.0 lens. The radioactivity 3 mm from the rear element of this lens was ~20 cps (Table 1): it decreased to 5 cps at 5 cm and to background levels (1–2 cps) by 15 cm. Clearly, little of the radiation from this lens got far beyond the external element. I did a similar test to check for the effect of distance with the Carl Zeiss Jena Flektagon 50mm *f* 4 medium-format lens: the radiation was comparatively high (80 cps) at the rear mount and decreased to 10–20 cps at 5 cm and to 1–2 cps at 30 cm. As with the Canon lens, passage through the air significantly decreased the radiation. I then tested the effect of putting a plastic lens cap on the rear of the Flektagon: this decreased radiation to ~20 cps from the original 80 cps.


*Pentax 1000 Body.*

Finally, to see whether radiation might penetrate through a camera body to reach the film plane, I mounted the radioactive Pentax SMC 55mm *f* 2 lens to a Spotmatic 1000 body. As shown in Table 1, the radiation from the rear of the naked lens was ~300 cps. It fell to ~50 cps when attached to the body and measured at the film gate with the mirror up (but back of the camera body open). The reduction was presumably due to passage through the air within the camera. This test showed, never-the-less, that radiation from the rear element could penetrate to the film plane. Radiation fell further, to ~10 cps, at the same position when the mirror was down, so presumably it offers little threat of fogging the film under every-day use. I imagine, but did not measure, that radioactivity would decrease even further had the rear door of the body been closed and radioactivity measured 'outside' the body.


*Pentax SMC. 55mm f 2*

In addition to testing lenses, I tested a range of filters to see whether anti-reflective coatings or substances included to change the color-transmission curves might contribute to the problem. A range of original Hasselblad filters (50 and 63mm) gave reading about those of ambient (UV filters) or very mildly elevated radiation of 2–3 cps (Proxars, yellow and yellow-green filters). A UV Hoya filter also returned a reading of 2–3 cps, but a Photape B-50 orange filter a higher value of 3–4 cps.

**Fixing the problem**

A number of Web sources suggest that exposing a yellowed lens to sunlight will eventually cure the color cast (http://www.camerapedia.org/wiki/radioactive_lenses). Periods of up to 2 months can be necessary for the yellow tinge to be lost, although some reports said that two weeks was sufficient. Although UV light has generally been invoked as the curative factor in rectifying the defects in the crystal lattice structure of the glass, it may be possible that heat also has an effect, as heating is known to allow cause enough electron mobility to fill the color centre (see http://www.periodictable.com/items/090.5/index.html). I wonder though, whether allowing a lens to sit in the sun to heat up for two months over an Australian summer might have the undesirable consequence of allowing oil to volatilize within the lens and coat internal optical surfaces, or allow oil to become less viscous and spread onto the iris diagraph. At least these two consequences could be remedied by a quick disassembly and cleaning of the lens (though with the caveat discussed below).

**Safety issues?**

It's interesting that a large number of photographic lenses are radioactive. Almost all, with the possible exception of the Konica *f* 1.4, seem to pre-date the mid-1970s and many come from the 1940s to 1960s. I have read on the Web, but cannot otherwise verify, that Canon stopped using Thorium in its lenses in the mid 1970s because of the risk posed to machinery operators during the grinding and finishing of the individual lens elements. Also, I recollect an article, which claimed that Leica took pains to have any radioactive elements, placed deep within the lens and shielded by lead-containing optical elements on either side.

I'm not qualified to advise on the health implications of radioactive lenses. But it would seem that the greatest risk, apart from the original exposure to those people who made the lens in the first place, would occur when an affected lens is dismantled for cleaning. In most other cases, the metal mount and optical elements on either side of any Thorium-containing element may well provide suitable shielding. And, of course, the 'inverse square law' is on our side here, as doubling the distance from any source of radiation reduces by at least a factor of four the radiation dose. Moreover, the ill effects of radiation are a function of both intensity and duration of exposure, and most people would not have a photographic lens to their eye all day. Even so, it would probably not be wise to store your old Aero-Ektar under you bed for safekeeping and sleep on top of it for 12 hours every night! There may well be a much greater risk, however, posed by a radioactive eyepiece in a camera and, even more so, by radioactive eyepieces in telescopes, binoculars or microscopes. In these cases, users could have the radioactive elements very close to their highly radioactive-sensitive eyes for long periods of time.

Of course, any radiation risk posed by old lenses has to be placed into the broader context of the radiation dose we received naturally every day. It may be the case that, for example, simply flying to Alice Springs to photograph those wonderful River Red Gums in the West Macdonnell Ranges exposes us to a greater radiation dose from cosmic radiation than would the periodic use of an old lens once we got there. Perhaps this might be an issue which an experienced radiographer, should one be a member of the Society, could address?

*Table 1: Radioactivity of a range of lenses at the rear lens-mounting flange and at the front filter-retaining screw. Cells shaded light grey show clearly radioactive lenses.* [YY] *= very yellow color cast;* [Y] *= slight yellow color cast*

| Item measured | Radioactivity (counts per second) | |
|---|---|---|
| **Background reference radiation** | | |
| Internal rooms in my house | ~ 1 | |
| External brick wall of my (1950s) house | 1–2 | |
| Television cathode-ray tube | 2–5 | |
| Commercial (domestic) smoke detector | ~ 1 | |
| **Lenses tested** | **Front** | **Rear** |
| Canon New FD 20 mm *f* 2.8 | ~ 2 | ~ 1 |
| Canon FD 28 mm *f* 3.5 silver front | ~ 2 | 1–2 |
| Canon FD 28 mm f 2.8 | ~ 1 | ~ 1 |
| Canon FD 35 mm *f* 2.0 silver front[YY] | 8–10 | 20 |
| Canon FD 35 mm *f* 3.5 silver front | ~ 1 | ~ 1 |
| Canon New FD 35 mm *f* 2.0 | ~ 1 | ~ 1 |
| Canon TS 35 mm *f* 2.8 | ~ 1 | ~ 1 |
| Canon FD 50 mm *f* 1.4 | ~ 1 | ~ 1 |
| Canon FD 50 mm *f* 1.8 | ~ 1 | ~ 1 |
| Canon FD 135 mm *f* 3.5 silver front | ~ 1 | ~ 1 |
| Canon FD 35–70 mm f 2.8–3.5 zoom | ~ 1 | ~ 1 |
| Konica Hexanon AR 50 mm *f* 1.4 [Y] | 2–3 | 300 |
| Konica Hexanon AR 50 mm *f* 1.7 | ~ 1 | ~ 1 |
| Kowa 6x6 55mm *f* 3.5 (black) | ~ 1 | 3–4 |
| Leica R (2 cam) 35 mm *f* 2.8 | ~ 1 | ~ 1 |
| Leica R (2 cam) 90 mm *f* 2.8 | ~ 1 | ~ 1 |
| Minolta MC Rokkor SI 28 mm *f* 2.5[YY] | 10 | 10 |
| Minolta MC Rokker PF 50 mm *f* 1.4 | ~ 1 | ~ 1 |
| Minolta MC Rokkor PG 58 mm *f* 1.2[Y] | 1–2 | 1–2 |
| Minolta MC Rokkor PF 85 mm *f* 1.7 | 1–2 | 1–2 |
| Minolta MC Rokkor PF 135 mm *f* 2.8 | ~ 1 | ~ 1 |
| Pentax SMC Takumar 35 mm *f* 3.5 | 1–2 | ~ 1 |
| Pentax SMC Macro-Takumar 50 mm *f* 4 | 20 | 30 |
| Pentax SMC Takumar 55 mm *f* 1.8 | ~ 1 | ~ 1 |
| Pentax SMC Takumar 55 mm *f* 2 (Lens A) | ~ 1 | ~ 1 |
| Pentax SMC Takumar 55 mm *f* 2 (Lens B) | 1–2 | 1–2 |
| Pentax SMA Takumar 55 mm *f* 2 (Lens C) | 2 | 300 |
| Pentax SMC Takumar 135 mm *f* 3.5 | 1–2 | 1–2 |
| Pentacon 6 – Carl Zeiss Jena Flektagon 50 mm *f* 4 | 2–5 | 80 |
| Pentacon 6 – Carl Zeiss Jena Flektagon 65 mm *f* 2.8 | ~ 1 | ~ 1 |
| Pentacon 6 – Carl Zeiss Jena Biometar 120 mm *f* 2.8 | ~ 1 | ~ 1 |
| Tokina RMC 200 mm f 3.5 | ~ 1 | ~ 1 |
| Yashica ML 35 mm *f* 2.8 | ~ 1 | ~ 1 |
| Yashica ML 50 mm *f* 1.7 | ~ 1 | ~ 1 |
| Yashica ML 55 mm *f* 2.8 Macro | ~ 1 | ~ 1 |

# Most Common Brownie of Them All

**By Lyle Curr**

This little discourse is primarily about a group of 4 Box Brownies from the 50's, and one in particular, with a peek at the quite singular branch of our hobby that concerns itself with the collection of the Box Brownie generally. But, those of you who regularly read my offerings to this illustrious magazine will be used to me starting anything I present with an historic setting of the scene, and a preamble that appears to bear no relationship to the topic indicated by the title.
Well this is no exception!!
If you are a collector of top shelf cameras, the mint Leica and the Nikon rangefinders that some of us just dream about; if you have half a dozen Hansa Canons in your safe at the bank, or a couple of mahogany and brass Daguerre or wet plate woodies on your mantle; your Apo Lanthar lensed Voigtländers stare at you from glass shelves in your living room, you will not have noticed how the general antique/collectible camera market has been moving over the last 2 or 3 years.
But, if you have been trying to liquidate your collection of 35 years as I have in that time, you will have noticed that basically the derrière has fallen out of the value of even the upper to middle range of collectible cameras. Only the real top shelf stuff mentioned above seems to have –and always will I might add- held its value or actually increased.
If your collection is the type held by most of us it may be a significant one historically, but now is not a time to attempt to use it as the basis of purchasing a new house in the go ahead suburbs of Sydney or Melbourne.


One would have thought that the market in general black folders may have risen -Those #1 Folding Pocket Kodaks from the 20's, which look great in an antique shop with $125 on them, but that you can buy at a camera show where they are not uncommon for $15-30- Not so. The antique shops can't get rid of them either, so don't clean out even the bottom of your cupboards, well not just yet anyway.
Now I have been looking for a way to express all of the above for some time now, and while it may be a little indulgent of me to do it here, it does lead me to the subject of our little story for today.
There is a move in one area against this downward trend, and it is easily discernible in the antique shop, Internet based sales, and the camera market.
**The Brownie Flash II**, the most common Box Brownie of them all, has certainly risen in value over the last couple of years. And its brothers in the same series of mundane (???) UK made 1950s Box Brownies have been subject to the same effect. (I was going to use the word "phenomenon" there, but I don't think the rise in value of a Brownie Flash II from $5 to $12 warrants the use of that term!)

Here perhaps a slight digression into the monetary value of the Box Brownie. Aside from the very first model and the Rose Beau Brownie, ($1500-$3000), The Brownie Minor ($1000) and the Brownie Specials and other Beaus ($200-500) most collectors lump them all together and give them very little value at all. But even the most common ones are now bringing up to $12-15. Some of the coloured models, and the ones with nice faceplates have reached to the $50-$100 mark, and some of the really rare ones are in the $200-300 group. I will look at the value of the specific cameras under discussion in the text, but there is a situation in valuing box Brownies that does not appear in other

camera groups. If you walk into an antique shop and see Box Brownies on the shelf, its odds on they will all be the same price. This is because other than "experts" most people can't tell them apart. Use this fact, and you will pick up some cheap cameras occasionally.
Anyway………. back to the matter at hand.
So what of this camera at the bottom end of the market that defies the trend of that market??
The Box Brownie has been around since 1900, and while a few of the models made over the years have been interesting to some collectors, none other than the very first model and a couple of others have become valuable.
Most of them have been made in great quantities and as most of them were black box cameras that looked pretty much the same, they have never been given a glance by "serious" collectors either in antique shops, op shops or camera markets or even on other collector's shelves.
Kodak Ltd in the UK started producing box Brownies in the very late 20's, but in the immediate post war years, the Box Brownie became virtually an English product and those myriads of Brownie C's, D's and E's you see in op shops were all from the UK.
But, in May of 1957, Kodak Ltd in the UK replaced their successful and long lived range of Box Brownies with a spruced up group of these simple but rugged picture takers. The 40's and early 50's box Brownies as alluded to above had a letter to differentiate the models. In the new lot, this was replaced with a number.


Now, as with most of Kodak's confusing nomenclature, this number indicated the level of specification, not chronology and in 1957 the Brownie Model 1, Brownie Flash II, Brownie Flash III and Brownie Flash IV were introduced – not necessarily in that order. All used 620 film, and all were leatherette covered, all metal box cameras with a simple T&I shutter and a simple f14 Kodet single element glass lens. Also the front plate of the new group now sported the olive greeny coloured painted lines, which were familiar from the Brownie 127 and Cresta II cameras of a few months earlier.
Within each model there was a plethora of minor, insignificant variations like different shaped screw heads and different grains in the cheap leatherette covering; deviations, (I use the word advisedly!!!) which a number of the "rivet counters" amongst you laud, worship and search for with great enthusiasm. But we will concern ourselves here only with major differences between the 4 models.

In May 1957, the Six-20 Brownie C was replaced with the **Brownie Model 1 Camera.**
The simplest of the group, it had no features at all apart from the lens and shutter mentioned above. It was only made with a black covering, and was only produced till mid 1960, which makes it a little scarce. If you see one of these in really good nick, you could expect to pay around $20 for it.


In July of 1957, the Brownie Flash II Camera appeared. This would have to rate as the most common Box Brownie of all time. Made in both the UK and here in Australia, it was literally produced by the millions. No one seems to be able to put a production figure on it, but we do know that over half a million came off the assembly line at the Kodak Australasia Abbotsford plant alone. Here in Australia production began in January 1958, being assembled from mainly imported parts, but by the time production of the camera ceased here in 1962, two years later than in the UK, 95% of it was being locally manufactured. Only the lens was being imported at that stage.

As its name suggests, it was now equipped with flash contacts. These were of the Kodak screw and pin type, and the Brownie flash holder was made specifically for this camera. It still had the simple T&I shutter, but with a nice brushed chrome plate at the controls on the side of the camera. The Flash II also had a close up lens on a slide, designed to make Mr and Mrs Snapshooter into portrait photographers, and the instruction booklet had a section specially added to enable them to do just that! The Flash II also has a tripod socket on the base. It is by far the commonest of the cameras of this series, and indeed probably the commonest of all Box Brownies.

The Flash II also sold here in Australia in an outfit box, complete with flash, bulbs, film, batteries and instruction booklets for both camera and flash. The "normal" outfit box is quite scarce, particularly complete, but in 1958 for a few months a special box was used, celebrating the Golden Jubilee of Kodak Australasia Pty Ltd, which had started life as Kodak Australia Ltd in 1908.This Jubilee Year outfit box is hen's teeth material, and if you are at all interested in box Brownies and you see one of these boxes, grab it at almost any cost.


The **Brownie Flash III Camera** was actually introduced in May 1957, a couple of months before the II, and concurrently with the Model 1. Even though it was made right through to 1960, the Flash III is not a common camera and is rarely seen for sale. When it is it usually brings around $50-75. Even back in 1957 it was considerably more expensive than the Model 1 and the Flash II and presumably did not sell well because of this.

Very similar in appearance to the II, it has the same flash contacts, but the brushed chrome plate at the controls extends down the side of the camera to the shutter release. The shutter has a lock to prevent accidental exposure, and as well as the portrait lens on a slide, there is another slide with a yellow filter. This was for enhancing clouds etc in black and white. It also has a tripod bush on the base.


The **Brownie Flash IV Camera** appeared in September of 1957, and was only made till 1959. This is the scarcest of the group, and while it is still a cubic shaped box camera, its appearance was nothing short of startling. Again, it was much more expensive and therefore did not sell well. With all the same attributes as the Flash III, but reverting to a design device Kodak had not used for almost 30 years, the box Brownie was again in glorious colour. Yes, the IV had a light brown leatherette covering, gilt metal work and dark brown paintwork and carry strap. The dark brown paintwork even extends to inside the camera. It also had a white plastic winding knob and shutter release button. It has the same flash contacts as the II and III and a special Brownie flash holder in white plastic was made as an accessory for this particular camera. The brushed chrome extended plate at the controls is now gold coloured, as are the filter and close up lens slides and shutter lock. Even the tripod bush on the base is gold coloured. This IS a scarce camera, is a very attractive addition to a collection, and is usually priced accordingly. You could expect to pay $80-$125 for a nice Flash IV.

That's the story of four late 1950's members of the worlds camera manufacturing's most populous club. There are myriads of variations within the models of these cameras and there are few

collectors who simply specialise in these variations and have a wonderful time hunting, finding and then discussing amongst themselves the minuiatae of the Box Brownie.
But there are some distinct variations of that very common model, the Flash II that need to be mentioned before we finish.

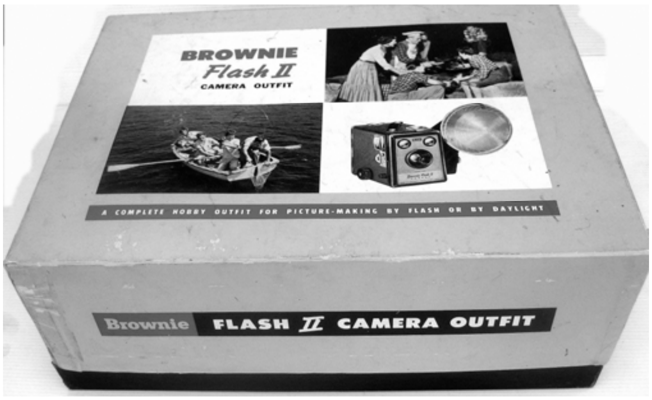

The made in Australia versions are more sought after than the English. Not marked "Made In…" Australia, as technically it was still just assembled here, the camera was simply labelled with the Kodak Australasia name, and Melbourne Australia. The Australian labelling actually appeared in at least two guises, in large and small lettering.
While not strictly a variation in the camera, but rather in the packaging, the Flash II Jubilee Outfit already mentioned above deserves to rate on its own. It is really scarce and I have only ever seen one in over 35 years of Kodak collecting.


The humble Box Brownie is THE most common camera ever. When you ask at a garage sale "do you have any old cameras?" the response is usually, "Oh, you mean box Brownies." Any box shaped camera has taken on the generic name of "Box Brownie" It is a cultural icon of all but the latest generation and has recorded more family history than any other device.
Conceived as a simple child's camera, it became a phenomenon, and deserves its place in photographic history, and a place on your collection shelf!
So add a couple to your collection if you don't already have, it will never be a super investment. You will also own a camera that has been part of the lives of more people on this planet than any other ---and that is actually climbing in value against a general trend!!!!

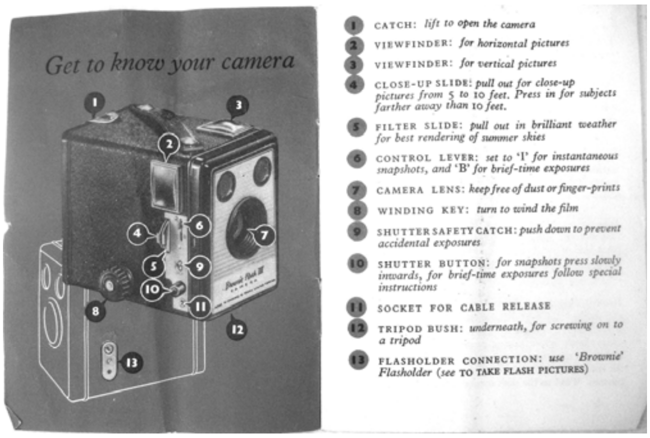
The controls L to R of the Model 1, the Flash II, the Flash 3 and the Flash IV, from the simplest with just a T, I lever and a shutter button, to the gilt finished with shutter lock, portrait lens and yellow filters on slides, and the crisp white of the winding knob and shutter release.


Model I Flash II Flash III Flash IV

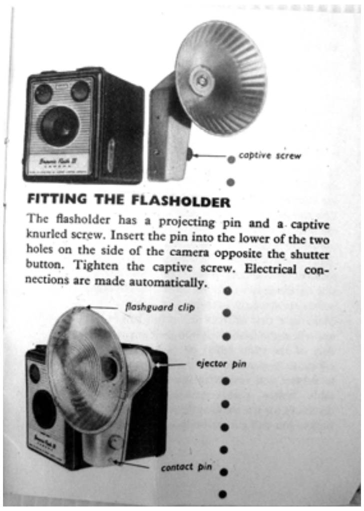
Below, the “ordinary” Flash II outfit box, and right, the top of the line Brownie Flash IV.





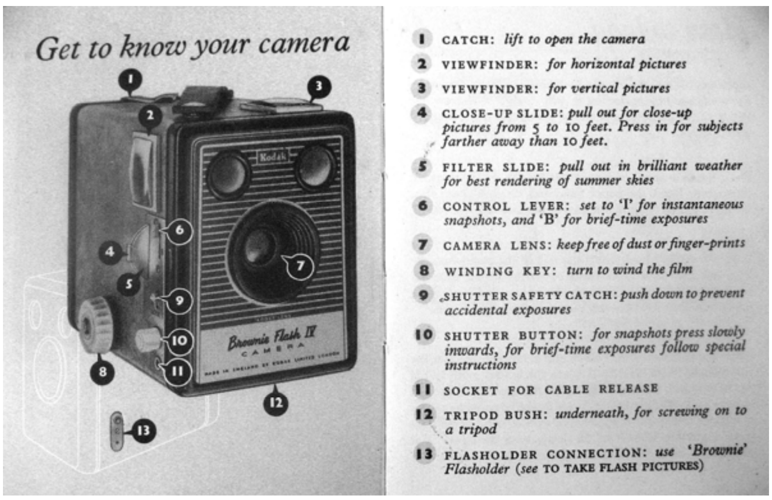

Get to know your camera

1 CATCH: *lift to open the camera*
2 VIEWFINDER: *for horizontal pictures*
3 VIEWFINDER: *for vertical pictures*
4 CLOSE-UP SLIDE: *pull out for close-up pictures from 5 to 10 feet. Press in for subjects farther away than 10 feet.*
5 FILTER SLIDE: *pull out in brilliant weather for best rendering of summer skies*
6 CONTROL LEVER: *set to 'I' for instantaneous snapshots, and 'B' for brief-time exposures*
7 CAMERA LENS: *keep free of dust or finger-prints*
8 WINDING KEY: *turn to wind the film*
9 SHUTTER SAFETY CATCH: *push down to prevent accidental exposures*
10 SHUTTER BUTTON: *for snapshots press slowly inwards, for brief-time exposures follow special instructions*
11 SOCKET FOR CABLE RELEASE
12 TRIPOD BUSH: *underneath, for screwing on to a tripod*
13 FLASHOLDER CONNECTION: *use 'Brownie' Flasholder (see* TO TAKE FLASH PICTURES)

FITTING THE FLASHOLDER

The flasholder has a projecting pin and a captive knurled screw. Insert the pin into the lower of the two holes on the side of the camera opposite the shutter button. Tighten the captive screw. Electrical connections are made automatically.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1 CATCH: *lift to open the camera*
2 VIEWFINDER: *for horizontal pictures*
3 VIEWFINDER: *for vertical pictures*
4 CLOSE-UP SLIDE: *pull out for close-up pictures from 5 to 10 feet. Press in for subjects farther away than 10 feet.*
5 FILTER SLIDE: *pull out in brilliant weather for best rendering of summer skies*
6 CONTROL LEVER: *set to 'I' for instantaneous snapshots, and 'B' for brief-time exposures*
7 CAMERA LENS: *keep free of dust or finger-prints*
8 WINDING KEY: *turn to wind the film*
9 SHUTTER SAFETY CATCH: *push down to prevent accidental exposures*
10 SHUTTER BUTTON: *for snapshots press slowly inwards, for brief-time exposures follow special instructions*
11 SOCKET FOR CABLE RELEASE
12 TRIPOD BUSH: *underneath, for screwing on to a tripod*
13 FLASHOLDER CONNECTION: *use 'Brownie' Flasholder (see* TO TAKE FLASH PICTURES)

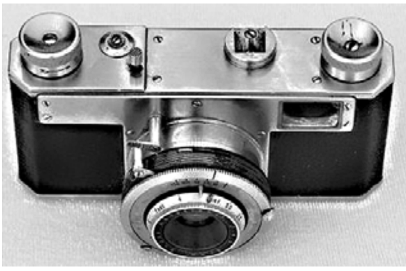
# Letters to the Editor

G'day Ian,

While going through previous issues pondering on the concept of putting a synopsis of the content on the website, a couple of things came to light. As stated by many other members, the quality of the publication has improved considerably over the years and the variety of content must have appeal for the variety of member interests. With the latter in mind it would be great if more members with non-equipment interests contribute articles on images and processes for example. As my knowledge of the history of photography increases as a result of my being part of the Society, I find out how little I know about so much! Keep up the good work. By the way, in issue #75 you mentioned an anomaly... you are actually incorrect in your observation. Ladies "wristlets" actually came into vogue in the late 1800's, before men adopted the wearing of wristwatches. Regards, **Alan King. #133.**

*There's a hint for new articles from those with a specific interest and a desire to share it. Thanks for the approval of Back Focus improvements but, as stated at the last meeting, it's only with the support of the contributing members that we have such fine content for me to work with.*
*Re: the wristwatches, my comment was made from having seen the watches on site and noticing, as said in* ***my observation in the original text,*** *that these are* **modern** *watches. Also, I would assume, from a price point in those days, that these "wristlets" would be more likely to be owned and worn by the "lady of the house" and not the hired kitchen help. Ian.*

**On Back Focus is the question about an unknown camera**, well I have an idea.
After the World War 2 the patents of the German industry were free, everybody could use them. In that time many manufactories tried to make Leica copies.
In Japan, Sowjet Union and a short time in Germany it was possible to make good working cameras, but in the UK and USA they could not get the good quality for a reasonable price.
This camera can be a Zeiss Contax copy. It was not made on the European continent for in that time were the countries poor and you had to ask your government if you may buy an American product that must be pay in dollars. The answer was mostly NO.



You had to use French lenses and shutters, around 1950 you could get German lenses and shutters too.
This camera with its Kodak lens and shutter must be made in the UK or USA. If it was sold as a commercial product a name should be engraved. In my view it is a prototype, probably there are four or five more, to try out the quality and the production costs.

I am curious to the other answers. Cheers, **Han Fokkelman. #440.**

*At the time of compiling this issue, this reply from Han was the only one received regarding the possible origins of this mystery camera. Ed.*

## Talk on Camera Collecting to Corel Down Under

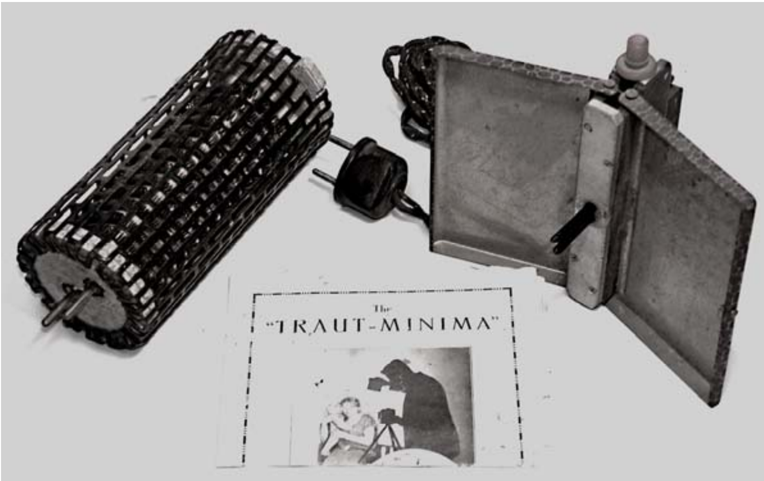
Corel Down Under User Group is a largely digital user group meeting at Ringwood using Corel software and, following an invitation via one of their members, I attended their May meeting and gave a talk on the delights of camera collecting. This was backed up with around fourteen to fifteen of the more desirable pieces from my collection and centred on their history and how they came into my hands. Other humorous anecdotes concerning 'hits and misses' both of my own and as related to me by fellow members were also woven into this talk. I'm pleased to say that it went down quite well and an invitation for a similar talk to another group has arisen out of it. My entire stocks of spare Back Focus promotional copies were also eagerly snapped up. **Ian Carron.**

# EARLY ARTIFICIAL FLASH LIGHT. **Tom Hellwege.**

Although it had taken over a century to produce the chemically instant image known as a "A Photograph", the ability to capture immediate action had been achieved much faster by the use of "Flash Light."
From the time of Louis Daguerre, it became obvious that because of the amount of light required to take a satisfactory short exposure photograph; some type of intense, instant, lighting was required.

By 1851 many things had been tried, such as, Carbon Arc Lights, and the light known as "Lime Light" which was an Oxygen-Hydrogen flame played onto a block of Lime which produced a very bright white light, but these, whilst giving off large amounts of light, were not completely satisfactory for instant photographs.

One example of the Carbon Arc Lights for the amateur, was the hand held "Traut - Minima Pocket Arc Lamp". This consisted of a Metal Folding Case, the inside of which was polished to form reflectors, and had provision for fitting two carbon rods. Also there was a resistance provided which was suitable for the various voltages. This device could be plugged into a light socket or power point. But again this was a sustained light source, and not really satisfactory for instant, short exposure photographs.



***Traut Minima Arc Light.***

In 1864, inside a coalmine in England, a large amount of magnesium wire was ignited, to provide illumination for a Photographic Project. This provided the stimulus for the use of Magnesium for Flash Photography.

Magnesium is a very common metal, and was an excellent choice for instant illumination because of the amount of instant light it provided. It became available in Powder, Ribbon, Sheet or Wire form, and was easily ignited when dry, and all of which burnt with a short blinding flame.

**MAGNESIUM WIRE OR RIBBON.**

In 1862 experiments began into the use of Magnesium for this instant light source. This was either in the form of Magnesium Ribbon, or Wire, which were ignited by use of a flame or electronically. This wire or ribbon could be loaded into a Magnesium Flash Holder. When sufficient to take a photograph had been fed out, it was then fired. By this feeding out method only that portion which had been fed out of the devise would explode.

**Magnesium Flash Holder in Photo. MAGNESIUM FLASH POWDER.**

In 1887 in Germany two German inventors mixed a new compound of Magnesium Powder with Potassium Chlorate to produce a Flash Powder. This Magnesium Powder gave off a brilliant light suitable for Photography. However it also gave off great clouds of smoke and ash and was potentially dangerous if used close to curtains, drapes or other flammable material. But even with the potential for such danger, it became very popular and widely used through out the world.
This "Flash Powder" could be used by pouring it directly onto any surface, and then firing it by the use of a flame or spark, or by the use of a touch paper.

One of the most popular methods for using flash powder was a metal tray on a handle. The powder was poured into the tray, and this in turn was ignited by a flame or spark. The one in my collection was ignited by using a cap from a child's cap gun being inserted into a mechanism under the tray, and then with one finger, part of this mechanism is depressed and then released to ignite the cap, which in turn ignited the powder.

A most favoured method for taking a photograph was to leave the shutter open until after the flash had been fired.


*Flash Tray and Powder.*

**Paper Flash Powder containers.**

Another popular method of using the flash powder, was to place it into a paper sleeve or container which had a touch paper attached to it. The container is then tied to a stick or some other convenient place away from flammable material, the tough paper was then lit and when it burns down to the powder, it fires.

**FLASH SHEETS.**

Also popular was the Flash Sheet. This was a sheet of Magnesium about 6 Inches by 4 Inches in size. This sheet was fixed to a sheet of Cardboard or similar, or to a metal frame. Again it was kept well away from curtains or other flammable material. It was then fired by applying a flame to it.


***Zeiss Icon, ICA flash Powder container with touch paper and string tie attached. Packet of flash sheets at top left.***

However despite these efforts, something else was needed for use by the amateur photographer, that was safe, quick, and easy. The answer to this was the Flash Bulb. The first modern flash bulb was invented in 1925 by an Austrian, Paul Vierkotter. This was Magnesium in an 80 Percent evacuated glass tube, which allowed sufficient Oxygen to remain to react to the Magnesium when fired electrically.

Following this there were numerous attempts at producing a practical Flash Bulb. It was then found that Aluminium Foil, in a low pressure Oxygen Atmosphere Globe, and electrically fired, was an improvement on the Magnesium, and cheaper to produce. These globes were basically a standard electric light globe with an Edison screw base, or a bayonet base.

In 1927 the first " Sashalite " Flash Bulb, made by General Electric England, was invented. It came onto the market in 1930. Originally the same size as household light globes, with bases, either screw or bayonet. Then later they produced smaller globes with screw or bayonet bases, these were deliberately made the same as the fittings used in torches, and a mere 4.5 Volt was needed to fire these bulbs.

In 1932 the Dutch Firm of Philips developed an Aluminium-Magnesium Alloy which could be drawn into a very fine wire. This wire was then incorporated into their full range of " Photoflux " Flashbulbs replacing the Foil types of bulb.

In 1932 the German made " Vacublitz " appeared. These were originally the same size and shape as an ordinary Household Light Globe, with an Edison Screw, or Bayonet Base, which were filled with

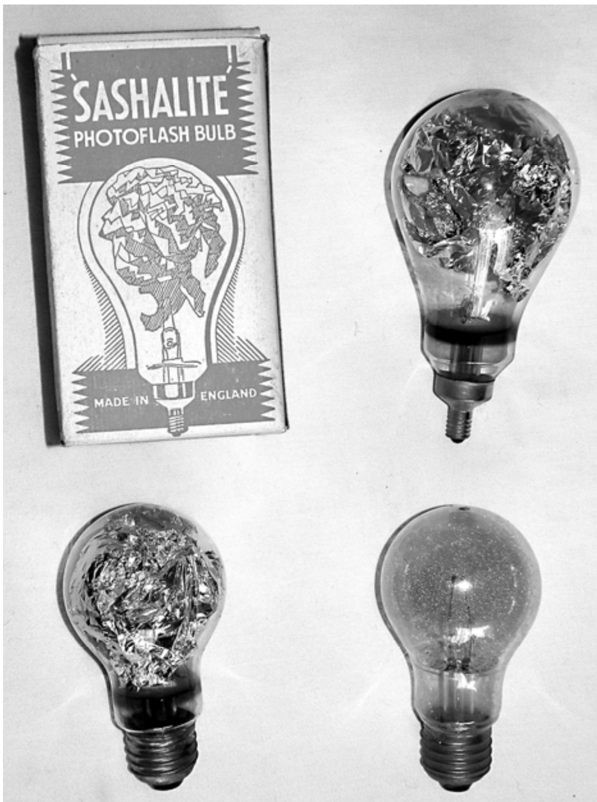
Aluminium Foil sealed in Oxygen and fired electronically. The full range of smaller Vacublitz Bulbs then followed.

*Some of the large variety of bulbs to be made available to the photographic market.*

And as the magnesium in these bulbs was contained within the bulb, it offered greater safety from the bulb exploding. Later bulbs were coated with a layer of lacquer. This allowed the glass to be contained within the coating in the event of the bulb exploding. Some early bulbs also had a reflective foil inside the bulb to increase the reflective power of the bulb. A lot of bulbs also had an indicator blue spot painted on their inside. This would turn pink should there be any leakage of the oxygen from the bulb, which rendered it dangerous to use.

Further improvements to these flash bulbs included, reducing the size of the bulbs whilst retaining the Edison Screw and Bayonet Base type of bulbs as well as Baseless Bulbs, which had wire contacts emerging from the base of the bulb.

Later improvements include, the introduction about 1955 of a Blue Coated Bulb for Colour Photography.



*The Sashalite, introduced in 1927.*

The Flashcube came in about 1965, which had Flash Bulbs built into the Four Sides of a Plastic Cube. Each Bulb had a plastic reflector behind it. The camera had a socket to insert the cube, which would rotate the cube as the film was wound on. They were fired electronically, requiring very low voltage.

The Magicube appeared in 1970, it was almost identical to the Flashcube, but were fired mechanically by a pin sticking into a capsule of fulminating material.

Then in 1972 the High Powered Flashcube, was similar to the Flashcube but giving off about twice the amount of light.

Then in 1975 the 10 Bar Flip Flash. This featured a flat arrangement of 10 bulbs placed horizontally one above the other. Once a photo was taken, fuses selected the next bulb to fire. Then when half the bulbs had been used the photographer had to invert the Flipflash, which had a connection on both ends, to use the remainder. The Polaroid Flash Bar was similar to the Flipflash but the bulbs were placed vertically, in a horizontal arrangement. There were 10 bulbs, 5 to each side of the Bar. Once 5 bulbs were used, the Bar was rotated to use the other side.

Flashbulbs could only be used once and then thrown away. They remained popular until about 1980 when the far superior and reusable Electronic Flashlight replaced them.

# The Flush Back Kodak.

By Lyle Curr

There are many subtitles I could have chosen for this article, but unlike my normal, prolific self, I will refrain!

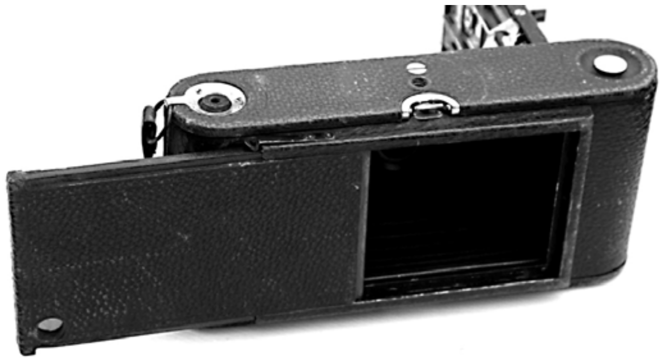
The Flush Back Kodak, which was introduced in 1908, continued in production till 1915. By any other name it was a #3 Folding Pocket Kodak, one of the very successful series of Kodak Folders that dominated amateur photography for about 70 years. The black Kodak folder, in its various guises, was made quite literally in the millions, but the Flush Back was not numerous.

The FB is a relatively rare Kodak folder, with only about 12,000 being produced.

The camera was made in the USA, but was only sold in Europe, South Africa and India.

Back in 1908, Kodak had been making roll film folders for years and had quite a grip on the market in the US. But in the UK and Europe, there were other manufacturers who competed very effectively in this market. One such UK manufacturer was W. Butcher and son, who made mainly plate cameras, particularly large falling plate box cameras, but who brought to the UK many well made folding cameras which actually originated in Germany. The bodies were imported to the UK where they were fitted with home grown lenses and shutters, and the Butcher's Carbine cameras were born.

A feature of the Carbine was the fact that not only did it use roll film, but the back of the camera had a sliding door in it, into which would fit a single plate holder. As the photographers of the day were still a little wary of ***roll*** film, the cameras with the plate option sold very well.

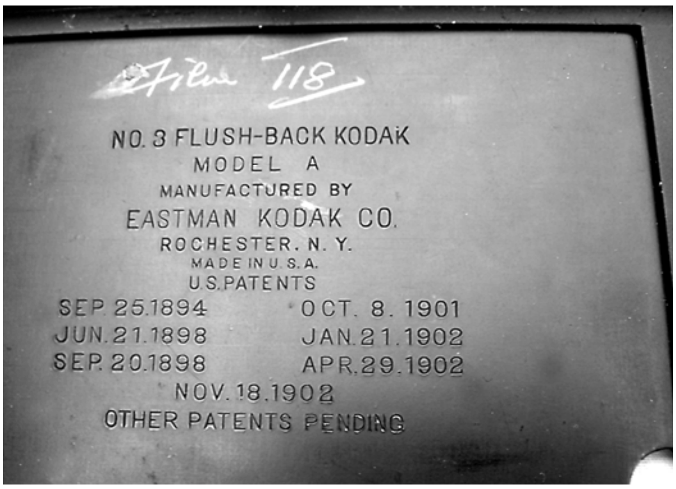


***Pic 1. The Kodak combination plate back.***

Now Kodak folders had always had available what was known as a "Combination Back" to enable almost any of them to use plates. But the Combination Back added about half an inch at least to the width of the camera, which made the already large- despite most of them incorporating the word "Pocket" in their name – camera very unwieldy. Also the Combo Back only took a large Kodak wooden double dark slide, which did give you 2 shots without reloading, but again increased the bulkiness of the package. **(Pic 1)**

No, the average British and European photographer preferred the convenience of the much easier to handle locally made plate using folding camera.

So the Butcher's Carbine reigned supreme at the time in England.

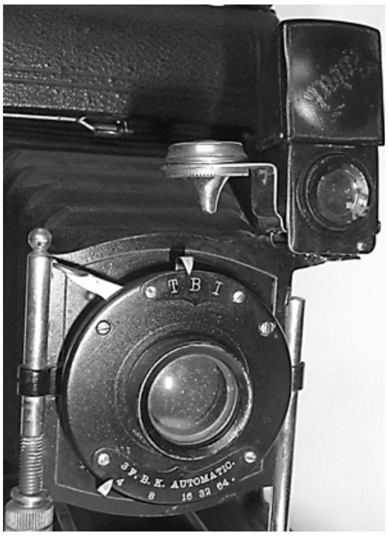



***Pic 2. The ID inside the back of the Flush Back.***

Kodak's answer was the Flush Back. Kodak was never backward in revamping models for a particular purpose, but usually did not change the name or model number. In the case of the FB, it got a complete name change, but retained its #3 to indicate its 3¼" X 4¼" size, using 118 roll film when not in plate mode. **(Pic 2)**

Like its competitors, the FB was made overseas, in this case by Kodak in the US, and shipped to the UK as a body. There, it was fitted with a special UK import shutter, or with one of various lens and shutter combinations made either in the UK or Europe. Another sales point was that in a lot of cases, the purchaser could choose their lens and shutter.

The example of the camera used for this article has the exported Kodak lens and shutter. But… while it is a Kodak shutter, a pretty normal #3 FPK Automatic actually, it has been renamed too, and is a #3 F***B***K Automatic. Also this particular shutter has normally a brass face, but in the case of



***Pic 3. Despite all the options, this one is fitted with a Kodak lens and shutter, and the lens face is black instead of brass, and the folding hood on the viewfinder is also black. Very European!***

***Pic 4. The FBK looking very much like a #3 FPK which of course it WAS!***

***Pic 5. The rear door of the FB. Note BRHC red window (missing) for use with film. You could be looking at the back of a Carbine as well; they were VERY similar from this angle. This IS the KODAK by the way!***

the FB it has been blackened, as also has the chrome-folding hood on the viewfinder. This makes the FB quite unique amongst other Kodak folders. **(Pic 3)** The rest of the FB was a standard #3 Folding Pocket Kodak, except of course for the plate back. **(Pic 4)** The plate back had a slide out metal lens panel, that was replaced by a single metal 1/4 plate holder. (3¼” x 4¼”)

***Pic 6. Shows focusing scale. Has 2 scales, but both for plates and film. The difference is feet and meters! Also another view of the unique black viewfinder hood.***

**(Pic 5)** There was what appears to be one strange difference between the FB and the #3 FPK. In 1908, at the time of the introduction of the FB, the #3 FPK Model C-5 also arrived on the scene. This model had a new focusing scale on the baseboard, which included an off set for plates as well as “normal” focus for films. The FB had only one focusing scale, as did the earlier FPK. **(Pic 6)**

The reason is the FPK used the combination back for plates, and this moved the film plane out, whereas the FB used films or plates in the same plane. **(Pic 7)**

***Pic 7. The THIN combination plate back of the FB. The plate was in the same film plane as a roll film.***

Despite the fact there were only a few thousand made, the FB must have been a reasonable commercial success, staying in production for just over 8 years. By the time of its demise, roll film had improved, and the Autographic Feature had been incorporated on all Kodak Folders. No one it appears was clever enough to invent an Autographic Feature for the plate camera!

The # 3 Flush Back Kodak was an interesting variation in that long stream of black Kodak folders, and breaks the monotony of the marque. You should have one in YOUR collection.

Happy Hunting, Lyle Curr.

## Images from the Musee suisse de l’appareil photographique Vevey.

**From Peter Jensen**