

The Butterfield Dial

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The Butterfield Dial is perhaps the best-known type of all Portable Dials. It is well presented and is attractive, usually contained in a fish skin case. About half of these dials were in silver and the others in brass. Sometimes the silver was gilt. There are many different designs and a few have been selected for this article. Nearly all of these dials are of a similar size, normally designed fit neatly into a person's pocket.

Butterfield Dials were designed to be used over a fairly wide range of latitudes and in order to achieve this, the gnomon had to have a variable angle and the dial plate itself had up to five individual chapter rings, each with its latitude marked. If the user was between two latitude rings, it was fairly simple to estimate the time from the difference of the other nearest ring. One of the most attractive parts of these dials is the small bird supporting the quite attractive gnomon and indicating the latitude on a small scale with its beak, usually calibrated from 40° to 60°. However, there were a few exceptions to this type of support, some of which will be shown later. Also, the underside of the compass bowl is either engraved with a list of towns and their latitudes or sometimes with some fine patterns or images. In one case illustrated there is a table for the Equation of Time.

A few dials of a similar style were made that were for a fixed latitude and these will be covered by a separate article.

Michael Butterfield was an Englishman, born in 1635. He went to Paris in 1677 where he set up an instrument making business. He died in 1724. The Butterfield Dial was named after him as it is believed that he introduced the design into France. He made many of these dials as did quite a few other French makers. There were also quite a few of these dials made in England and it is possible that the design came from England with him. These dials were basically produced in the two countries, France and England, but at least one of these dials



Fig. 1 An Octagonal Silver Butterfield Dial by Michael Butterfield.



Fig. 2 Underside of the Dial by Butterfield showing a list of Towns and their Latitudes.



Fig. 3 A Typical Fish-Skin Case.

is known to have been made in Russia. That dial, by Samoilov, is shown in this article. (see Figs. 13 to 15).

To start with I have taken a fairly standard Butterfield Dial, signed by Butterfield (Fig. 1). Size 67 mm x 57 mm. It is eight sided in silver and its gnomon covers the latitude range from 40° to 60° degrees. Also, it has four separate chapter rings at 3° intervals for the latitudes of 43°, 46°, 49° and 52°. Its compass is relatively small but some of them were even smaller, basically reducing the dial's overall accuracy. On its reverse are engraved 30 towns with their latitudes (Fig. 2). The towns listed on the circular base of the compass bowl are labelled '*Premier Cadran*' which refers to the outer chapter ring at 52°, usually marked with bold Roman Numerals, but not in this example. The *Premier Cadran* lists these towns:

- Londres 51 - 31 la Haye 52 - 6*
- Bruxelles 50 - 51 Liege 50 - 36*
- Calais 50 - 57 Lisle 50 - 40*

The other dials listed on the underside are



Fig. 4 An Octagonal version in brass signed Sautout Choisy.

in three sections and start with the following:

- 2 Paris 48 - 51*
- 3 Bordeaux 44 - 50*
- 4 Pau 43 - 12*

This dial's carrying case is made of green fish skin (Fig. 3).

A similar dial signed 'Sautout Choisy' (Pierre Sautout and Jean Choisy) was made sometime after 1682 (Fig. 4). Size 68 mm x 52 mm. This dial is in brass with some attractive ornamentation inside the inner chapter ring, and also on its gnomon. It was calibrated for the three latitudes of 40°, 45° and 49°, this outer scale being boldly marked with Roman numerals and is probably intended for Paris.

The shapes of these dials varied somewhat, some being octagonal, some rectangular



Fig. 5 Rectangular version by Nicolas Bion.



Fig. 6 A Rectangular Gilt Dial with large Compass by Michael Butterfield.

and some elliptical. A silver rectangular dial by Nicolas Bion, is shown (Fig. 5). Size 48 mm x 39 mm. He was born in 1655 and died 1733. He was well known for producing other instruments too. This dial, although being rectangular, has basically an octagonal layout, the four corners just being decoratively marked. The dial has three chapter rings for 40°, 45° and 50°. It is slightly smaller than most Butterfield dials.



Fig. 7 An Elliptical Dial by Chevallier with interestingly shaped Chapter Rings.

Another dial of rectangular shape is in gilt brass by Michael Butterfield (Fig. 6). Size 69 mm x 63 mm. It is unusual in that it has a larger compass. To do this Butterfield has had to place the gnomon's front bearing partly over the compass. This dial has three chapter rings, the outer one for 46°, the main one, in Roman numerals, for 49° and the inner one for 43°.

A fine example of the elliptical design is by Chevallier (Fig. 7). Size 66 mm x 50 mm. There were several makers by that name and it is not certain which one actually made this dial. One feature that is on this dial, and some others of octagonal shape, is that the chapter rings alternate between being elliptical and octagonal. (See also the dial by Sautout Choisy. Fig. 4.) It has chapter rings for 40°, 45° and 51° 30', so probably made for someone in London. The compass on this dial is rather small. Also, the dial does not use a bird to support the gnomon but just a leaf, its flat top edge indicating the latitude angle. For details see Fig. 30.

These are just a few of the French versions so now we look at some English ones for



Fig. 8 An Elliptical English Butterfield Dial by Thomas Heath.



Fig. 9 An Elliptical Butterfield Dial in Silver by John Rowley.

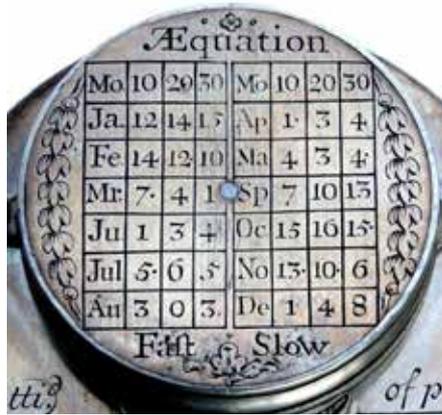


Fig. 10 The Equation of Time engraved on the underside of the Compass Bowl.

comparison. The first is a brass oval dial by Thomas Heath (Fig. 8). Size 94 mm x 68 mm. It is fairly simple and is without too much decoration. It covers a fairly narrow range of latitudes. There are three chapter rings, the main outer dial for 50° 20', the next for 56° and the inner for 48°. From the



Fig. 11 An Unusual Figure '8' Shaped Dial by Thomas Heath.

main latitude given, it was probably made for a customer in Plymouth. Its underside is plain with no engraving.

A much more attractive elliptical design, in silver, is by John Rowley (Fig. 9). Size 69 mm x 55 mm. It is made for three latitudes, 45°, 51° and 55°. This dial, unusually, also has a table for the Equation of Time engraved on the underside of its compass bowl, Fig. 10, for three dates, 10th, 20th & 30th, in each month.



Fig. 12 Unsigned English Butterfield Dial.

The next English Butterfield Dial is also by Thomas Heath (Fig. 11). Size 84 mm x 57 mm. This is a really unusual shape, something like a figure '8', having the round dial section joined to a large round compass, thereby making its setting and timekeeping more accurate. It has three chapter rings for 40°, 48° and 51° 32', this last being for London.

An unsigned English dial is shown in Fig. 12. Size 69.5 mm x 57 mm. This dial, which was probably gilded when new, has just two chapter rings, for 51° 32' (London) and 60°. It is oval shaped and well decorated on top, but the underside is blank. The bird pointer appears to be crested, so it is probably a jay. In the compass bowl, the compass does



Fig. 13 Russian Butterfield Dial by Samoïlov.



Fig. 14 Signature of Samoïlov.



Fig. 15 Russian Towns in Cyrillic Script.



Fig. 16 Butterfield Dial by Bizot using a Lion as the Gnomon supporter:

not have any declination marks but it has a scale around N of $\pm 20^\circ$ at 2° intervals.

Apart from these English dials at least one is known from Russia (Fig. 13). Size 62 mm \times 51 mm. It is in silver by Samoilov and is very similar to many of the French dials above. Naturally, the script is in Cyrillic (Figs 14 and 15). It has just two chapter rings for 45° and 60° , this main scale is probably for use in St. Petersburg. Its gnomon adjusts from 40° to 60° .

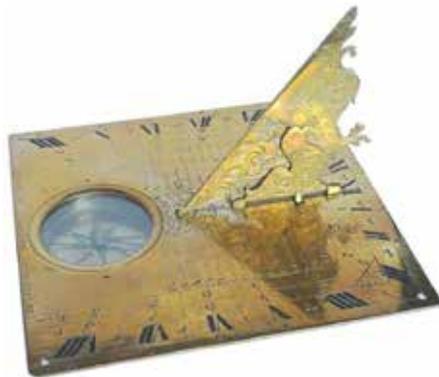


Fig. 17 A large sized Butterfield Dial by Michael Butterfield.

Amongst all the Butterfield Dials known there are several that are unusual, either in design or by the various attachments that they have. Some of these are presented here.

The attractive silver version by J. L. Bizot (Fig. 16). Size 57 mm \times 44 mm. It is a fairly standard version but instead of having a lit-



Fig. 18 Dial by Le Maire with its Gnomon supported above the Compass.



Fig. 19 A Silver Dial by Michael Butterfield with an added Plumb Bob.

tle bird supporting its gnomon, this has a gilt lion, the angle being read from a tab at the top of its head (see Fig. 31). It has chapter rings for 40° , 45° and 49° .

Another unusual version by Butterfield (Fig. 17). is in gilt brass. It looks fairly standard but this dial is dramatically larger than the others being 134 mm \times 132 mm. This dial is a little large even for big pockets. It



Fig. 20 Dial by Le Maire made for Northernly Latitudes.



Fig. 21 Northern Towns listed on the reverse of the Le Maire Dial.

has four holes in the corners which may have had screw feet in them for levelling it. Its chapter rings are for 43° , 46° , 49° and 52° . Its 28 towns with their latitudes are engraved on top of the plate either side of its gnomon.

A rectangular dial by Le Maire (Fig. 18). is made with its southern gnomon bearing set at the centre of its compass. Size 82 mm \times 62 mm. The compass is therefore fairly large, so that in order to accommodate the four chapter rings the east and west edges of it have been partially covered. The latitudes on its chapter rings are 46° , 49° and 43° , this last probably for somewhere on the Mediterranean coast.

An unusual version with an upstand at its north end is in silver, again by Butterfield



Fig. 22 A Brass Dial made for the Arabic Market by Le Maire Fils A Paris.



Fig. 23 Latitude Scale with Arabic Numerals.



Fig. 24 Underside of the Le Maire Dial with its Towns and Latitudes in Arabic Script.



Fig. 25 Butterfield Dial situated on top of an Equatorial Dial.



Fig. 26 The Equatorial Dial beneath the Butterfield Dial.



Fig. 27 Fine Engraving below the Double Dial with Eight Towns and their Latitudes.

(Fig. 19). Size 73 mm × 58 mm. This dial incorporates a plumb line, for perfect levelling, supported from a relatively tall support bracket. Its position on the north edge of the dial does not interfere with its normal operation. Dial latitudes are for 43°, 46°, 49° and 52°.

What looks to be a fairly standard Butterfield Dial is shown (Fig. 20). Size 67.5 mm × 59.5 mm. It is signed 'P. le Maire A Paris, A la Pierre d'Aiman'. The main difference with this dial is that it has been made for more northerly latitudes. It has chapter rings for 50°, 55°, 60° and 65°. Its gnomon is



Fig. 28 Bird Supporter by Butterfield.



Fig. 29 Swan Supporter by Le Febvre.

calibrated from 45° to 75°. Its list of towns and latitudes on its underside is quite interesting (Fig. 21).

Butterfield Dials were sometimes made for use in other countries and one made for the Arabic market is shown here (Figs 22 to 24). Size 70 mm × 56 mm. It is in brass and is signed 'Le Maire Fils A Paris'. All of the markings except for the signature are in Arabic script. Chapter rings are marked in Arabic at latitudes of 30°, 35°, 40° and 45°.

The final dial is unusual in that it is actually two dials in one (Fig. 25). Size 71 mm × 60 mm. It is unsigned but is certainly French. The dial on the top plate is of the standard Butterfield type. This has chapter rings for 40°, 45°, 50° and 55°. This top dial is hinged to the dial below, which is an Equatorial Dial (Fig. 26). This dial then covers a much wider range of latitudes, and may be set at any latitude from 15° to 85° on the latitude arc on one side. The same compass is used for both dials, the Butterfield part having an aperture through which to read it. The dial is attractively engraved in all spare areas with floral and foliate patterns. Its underside is particularly attractive, see Fig. 27. In the border around this are eight towns with their latitude figures and, on a ribbon across the plate is the motto 'CANDOR ET ODOR', 'Beauty and Perfume'.



Fig. 30 Leaf Supporter by Chevalier.

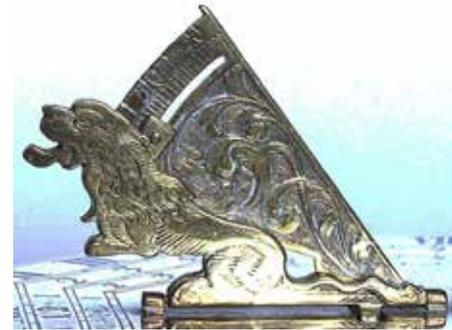


Fig. 31 Lion Supporter by Bizot

Gnomon Supporters

To give an idea of the variety of gnomon supporters four are here illustrated. The first, Fig. 28, is on the large sized dial by Butterfield shown in Fig. 17. It is a fairly standard bird pointing to the gnomon angle scale with its beak. The gnomon itself being delicately shaped by the scale. There is a bird on both sides of these gnomons but the latitude scale is usually only on one side. Both birds are joined together with a rivet through their eye which slides in the slot in the gnomon. Most Butterfield Dials had birds of a similar design to this. See also the Arabic Dial gnomon (see Fig. 23). The second, Fig. 29, is on a dial by Le Febvre. This still has a bird but this time it is a swan, again using his beak as a pointer. The next, by Chevalier, shows a simple leaf type support (see Fig. 30), its upper edge indicating on the latitude scale. This dial was shown in Fig. 7. The final gnomon supporter, Fig. 31, shows a gilt lion which is on the dial by Bizot. The latitude angle is being shown against a rectangular tab just above its neck. The complete dial was shown in Fig. 16.

There are many more types of Butterfield Dial, these being just a few of them. There are also many reproductions including a few modern ones, some of which are not easy to distinguish.

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