

The Case of the NGC 6962 Galaxy Group

by Steve Gottlieb

The *New General Catalogue (NGC)* by J.L.E. Dreyer, published in 1888, is a compilation of over 7,840 deep-sky objects previously recorded by a number of visual observers — most importantly, William and John Herschel. During the 97 years since publication of this catalogue, it has become the standard reference for deep-sky objects. However, many of these objects were not independently checked and verified, so a number of nonexistent objects, duplicate entries, and positional errors exist. Dreyer caught some of the mistakes and published corrected information as appendices in the two *Index Catalogues (IC I and IC II)* in 1895 and 1908.

More modern photographic surveys, such as the Palomar Observatory's *Sky Survey (POSS)* of 1950-1956 — made

with my 13.1-inch f/4.5 reflector operating at 166x. Using a 9mm Nagler eyepiece, the 30' field showed six galaxies (see sketch). I made the following descriptions of their appearance:

A. The fourth brightest of six galaxies is fairly faint, very small, and appears to be nearly edge on. The elongation is northeast-southwest and an arc of three equally bright stars is located just to the southwest.

B. The most difficult to observe of the lot. It is extremely faint and requires averted vision to see. No details are visible other than the galaxy's very small size — it is just a nebulous knot 10' north of D.

C. The third brightest is a spiral elongated in an east-west direction. A magnitude 10.5 star lies less than 1' to the east and interferes with viewing. The only noticeable detail is a slight brightening in the galaxy's center.

D. The brightest and largest in the group. This galaxy is fairly bright, slightly extended, and has a noticeably

The NGC 6962 Field: An Identity Crisis

Object	RNGC	CGCG	UGC
A	6965	6959	6959
B	6963	6963	6963
C	6967	6967	6965
D	6962	6962	6962
E	6964	6964	6964
F	6961	6961	6961
G	6959	—	—

using the 1.2-meter Palomar Schmidt — provided a more reliable check on the accuracy of *NGC* entries. Capitalizing on this, in 1973 astronomers Jack Sulentic and William Tift used the *POSS* plates to photographically identify *NGC* objects, provide accurate coordinates for epoch 1975.0, and give modern descriptions based on each object's photographic appearance. Their published work was titled the *Revised New General Catalogue (RNGC)*. In cases where no identifiable object was spotted within 5' of the original position, the object was dubbed "nonexistent" and categorized as Class 7. Unfortunately, the compilers of the *RNGC* and other modern catalogues were sometimes misled in their identifications by previous *NGC* errors in description and position, making it necessary to refer to the original sources to identify what's going on.

I recently ran across just such a discrepancy in the modern catalogues concerning the identities of members of a small group of galaxies in Aquarius, whose brightest member is *NGC* 6962 with a V magnitude of 12.0. I observed this little galaxy group on the morning of July 28, 1984 in the California Sierras

brighter core. A wide pair of stars collinear with D is 3' west. D is flanked by the fainter galaxies E and F on either end.

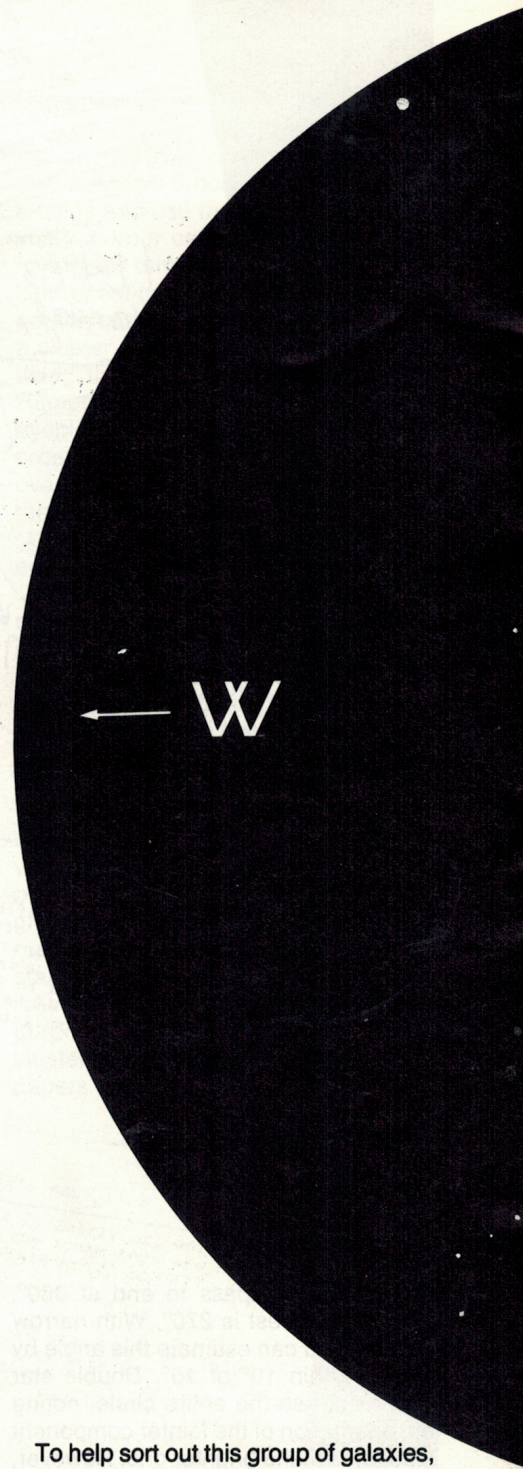
E. Just 2' southeast of D is the second brightest galaxy in the field. It appears moderately bright, small, slightly elongated north-northwest/south-southeast, and has a slightly brighter nuclear region. A magnitude 13.5 star is located less than 1' southeast.

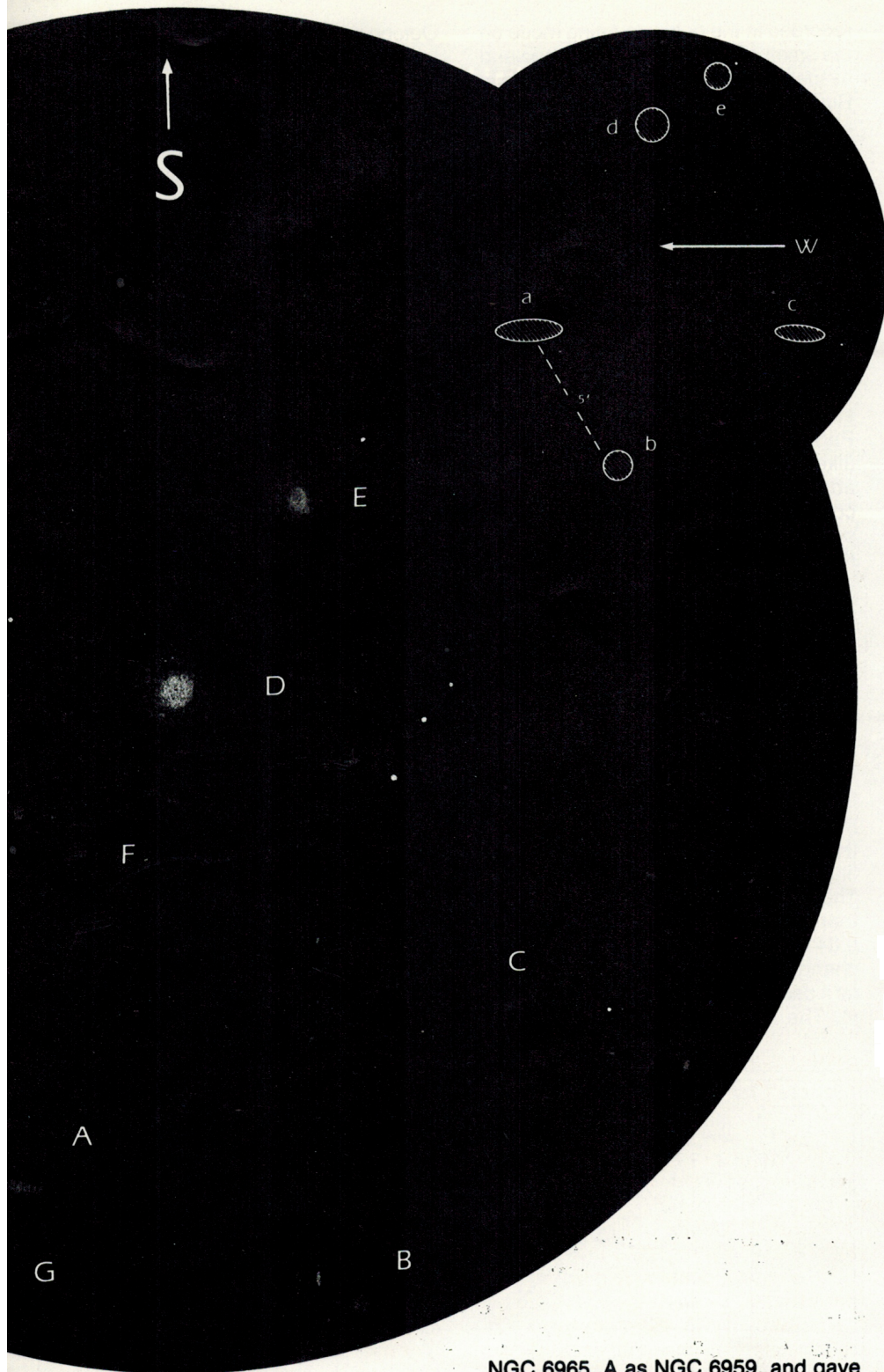
F. Similar to B, although possibly easier to view. It lies about 3' northwest of D. With averted vision, it appears as a round, hazy spot only 15" or 20" in diameter. As with B, I cannot detect any detail in this galaxy.

To help sort out this group of galaxies, I referred to the *RNGC*, the *Uppsala General Catalogue of Galaxies (UGC)* by Nilson, the *Catalogue of Galaxies and Clusters of Galaxies (CGCG)* by Zwicky, and the appropriate *POSS* print

Solving the Mystery

NGC	Object	Rosse	R.A.(2000)Dec.	Mag. (V)	Size
6959	A	a	20h47.1m +00°26'	~14.6	—
6961	F	—	20h47.2m +00°22'	~14.8	—
6962	D	d	20h47.3m +00°19'	12.0	3.0' x 2.5'
6965	B	b	20h47.3m +00°29'	14.1	0.7' x 0.7'
6964	E	e	20h47.4m +00°18'	12.7	1.9' x 1.4'
6967	C	c	20h47.5m +00°25'	—	—





Left: The NGC 6962 galaxy group sketched by Steve Gottlieb using a 13.1-inch f/4.5 Dobsonian at 166x. The galaxy marked "G" was added later after inspecting the Palomar Sky Survey plate of the area. **Inset:** The group sketched by William Parsons, Third Earl of Rosse, in August 1857. Parsons remarked of the NGC 6962 area, "a group of five nebulae, very many stars among them."

might be erroneous. He was confident that only the *CGCG* identified the other galaxies in the field correctly.

To pin down the source of the possibly erroneous *NGC* entry, I corresponded with Harold Corwin of the University of Texas at Austin. Corwin is a co-author of the respected *Second Reference Catalogue of Bright Galaxies*; he provided me with a copy of the Earl of Rosse's observations and a sketch of the field Rosse made in 1857 (see sketch).

In my sketch of the field, I followed Lord Rosse's lettering, so $a = A$, $b = B$, etc. (Object F, NGC 6961, does not appear in his sketch.) When he compiled the *NGC*, Dreyer entered Rosse's object B as NGC 6965, but with incorrect coordinates. This probably happened since Lord Rosse gave relative positions for members of groups rather than absolute coordinates. The

French astronomer Guillaume Bigourdan reobserved NGC 6965 in 1885 and reported it as a new discovery (IC 5058). He also found NGC 6963 near object B, but his position lands precisely on a faint double star 1.5' north of NGC 6965.

Apparently in an attempt to identify some galaxy on the *POSS* print for NGC 6965, Sulentic and Tifft picked A (in actuality, NGC 6959) and then reassigned the name NGC 6959 to its companion galaxy G. In a similar vein, the *UGC* chose object C (actually NGC 6967). The correct identities, 2000 coordinates, magnitudes, and diameters are given in the accompanying table.

In a recent letter, Thomson wrote, "If errors of cataloguing for northern hemisphere objects can still be found today, considering the vastly larger amount of observations carried out as opposed to the southern hemisphere objects, then clearly those objects located in the southern skies must present an even greater probability of possible errors regarding the published data."

(serial #0-305). The following four were identified by all sources: B = NGC 6963, D = NGC 6962, E = NGC 6964, and F = NGC 6961. However, the identities of three nearby galaxies — NGC 6959, NGC 6965, and NGC 6967 — were disputed.

The coordinates given in the *RNGC* identified C as NGC 6967, A as NGC 6965, and G as NGC 6959. (The last galaxy, G, is an extremely small and faint object which I could not see, but which is located 1' northwest of A.) On the other hand, the *UGC* listed C as

NGC 6965, A as NGC 6959, and gave no entry for NGC 6967. Finally, the *CGCG* agreed with the *UGC* in that A was NGC 6959, but gave coordinates indicating that C was NGC 6967. The *CGCG* — complete to photographic magnitude 15.5 — does not list NGC 6965. (See the table for a summary of this identity crisis!)

When the *POSS* print itself did not solve the dispute, I wrote to California observer Malcolm Thomson concerning my observations. Thomson, an experienced observer and contributor to the Webb Society's *Deep Sky Observer's Handbook*, responded by saying the original entry for NGC 6965