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ON SEVERAL "LOST" HARVARD VARIABLES

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One of important problems connected with the catalogs of variable stars is the following. For many faint variable stars discovered decades ago, their discoverers announced only approximate coordinates, which are reproduced in the GCVS. Currently, an attempt is being made by the GCVS compilers either to identify such stars with GSC or with the USNO A1.0/A2.0 catalog or to measure their coordinates on photographs and thus to improve the positional accuracy of the GCVS to the level sufficient for straightforward positional identifications during observations. However, quite a number of variables with uncertain positions have no finding charts in the literature.

More than 13000 variable stars were discovered, mainly in the first half of the 20th century, at Harvard Observatory. Among these stars, 1087 are lacking reference to a finding chart in the GCVS, and 1570, in the NSV catalog. Many of them can be found using the Harvard plate collection, especially taking advantage of ink marks left by discoverers on discovery plates. A large fraction of the "lost" Harvard variables are stars discovered by Luyten in 1932–1937 during preparation of the Bruce Proper Motion Survey, announced in several issues of the *Astronomische Nachrichten*, and listed in his catalog (Luyten, 1938).

To estimate the amount of work needed to find or recover the majority of the "lost" Harvard variables and the chances of success, we have carried out a small pilot project. Several stars, mostly Luyten's variables in different constellations, were chosen more or less at random. Then, one of us (M.H.) found the stars on plates of the Harvard collection, and the other (N.S.) identified the stars with the GSC or with the USNO A1.0 catalog or measured the coordinates. The results for 12 stars are collected in Table 1. Its last column contains identification with the IRAS Catalog of Point Sources (Neugebauer et al., 1988). The cases of V782 Ara, NSV 08216, and V CMa are discussed in more detail below.

Table 1: The positions of Harvard variables

GCVS, NSV	HV	GSC	α(2000.0)	δ(2000.0)	Source	IRAS
V782 Ara	9018		$17^h09^m14\overset{s}{.}48$	$-52°41'02\overset{''}{.}9$	A2.0	
NSV 08216	9017	8727.1397	$17^h08^m57\overset{s}{.}65$	$-52°39'23\overset{''}{.}6$	GSC	17049–5235
DU Aqr	9727	5209.0644	$21^h43^m23\overset{s}{.}40$	$-01°06'38\overset{''}{.}9$	GSC	
V CMa	3029	7087.0114	$06^h43^m40\overset{s}{.}71$	$-31°46'56\overset{''}{.}5$	Tycho	
SY Col	8054	7613.1614	$06^h27^m49\overset{s}{.}78$	$-38°34'04\overset{''}{.}2$	GSC	06261–3832
EK Mus	8437		$12^h24^m05\overset{s}{.}60$	$-67°48'07\overset{''}{.}8$	A2.0	12212–6731
NR Pup	8104		$07^h59^m42\overset{s}{.}58$	$-50°08'34\overset{''}{.}3$	A2.0	07583–5000
UU Pyx	8153		$08^h43^m12\overset{s}{.}05$	$-33°05'45\overset{''}{.}1$	A2.0	08411–3254
V559 Sgr	9184		$18^h01^m35\overset{s}{.}3$	$-34°47'58''$	N.S.	
V429 Sco	9153		$17^h56^m39\overset{s}{.}0$	$-34°59'54''$	N.S.	
BZ Tel	9277		$18^h11^m47\overset{s}{.}05$	$-49°53'03\overset{''}{.}8$	A2.0	
GQ Vel	8268		$10^h14^m55\overset{s}{.}48$	$-41°39'23\overset{''}{.}0$	A2.0	10127–4124?

Remarks to the table:

V559 Sgr. Three faint stars are present in the Digitized Sky Survey very close to the position of the variable. The coordinates measured by N.S. refer to the position of the north-western object, better agreeing with the discovery photograph.

V429 Sco. The position of the most probable candidate measured; many stars of the neighborhood are missing in USNO A1.0/A2.0 catalogs.

V782 Ara. This variable star was discovered by Luyten (1935). In the discovery paper and in Luyten (1938), two variables at almost the same position were announced, namely HV 9017 = AN 486.1935 ($17^h01\overset{m}{.}0$, $-52°31'$, 1900.0) and HV 9018 = AN 487.1935 ($17^h01\overset{m}{.}2$, $-52°32$arcm, 1900.0). Later Hoffmeister (1963) rediscovered AN 487.1935 independently, but did not publish any details. As a large-amplitude star (16.5 to fainter than 17.5, according to Luyten), independently discovered by two authors, HV 9018 was included into the GCVS as V782 Ara; HV 9017 remains a "suspected" variable star, NSV 08216 (13.0 to 16.0, according to Luyten). However, in the absence of a finding chart, it is by no means clear which of the two stars was rediscovered by Hoffmeister.

Both variables could be found by M.H. marked on the plates near the published positions. The brighter, NSV star, associated with an IRAS point source, is strongly variable and will be included in one of the next Name-lists of variable stars. In the course of the search for these two stars, M.H. discovered a new variable approximately in one degree to the north of Luyten's position: its A2.0 (2000.0) coordinates are $17^h09^m43\overset{s}{.}562$, $-51°40'51\overset{''}{.}80$. The star is bluish ($m_{blue}$ = 12.4, m_{red} = 12.1, color index $+0^m3$) in the USNO A2.0 catalog and very blue (negative color index) in the A1.0 catalog. However, most probably the star is a red variable with a large amplitude (at least 2 magnitudes), and its catalog color index may be due to variability on non-simultaneously-taken plates in blue and red light.

V CMa. The star was discovered by A. Cannon (Pickering, 1907) as a Mira with a 230^d period, later improved to $243\overset{d}{.}57$ by Payne-Gaposchkin (1950). Bidelman (1981) announced Me spectrum for the star, from Cerro Calan data. No finding chart was ever published. Additional confusion was introduced by the world-recognized reference source, "Geschichte und Literatur" (GuL). Thus, its first edition (Müller and Hartwig, 1918) identifies V CMa with "the southern, preceding component of a rather loose double star", whereas the second edition (Prager, 1934) says that CoD$-31°3605$ = CPD$-31°1311$

precedes the variable by 16″ — a rather *close* pair for the beginning of the century. The reference to magnitudes of comparison stars in the 4th volume of the GuL, 2nd edition (Schneller, 1957), is actually for V CMi, not V CMa. Harvard photographs do not show the 16″ companion of CoD−31°3605 (visible in the Digitized Sky Survey). The position of Cannon's variable corresponds to the description in Müller and Hartwig (1918). V CMa, identified by us with GSC 7087.0114, may also be identical to CoD−31°3607, but this identification is not certain due to a distortion in the CoD catalogue. Our identification of V CMa agrees with that adopted by Bidelman (1981).

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