Wide-Field Plate Archive Data Base

1. Introduction

The Working Group on Wide-Field Imaging (WGWFI) of the IAU Commission 9 'Instruments and Techniques' was established in July 1991 at the 21st IAU General Assembly in Buenos Aires. It was unanimously agreed that one of the most important tasks of the new WG would be the creation of a computer-readable Data Base with the existing wide-field plate archives and all astro-photoplates obtained from the end of last century until now (West, 1991, 1992; Tsvetkov, 1992).

The basis for starting this large project is the considerable progress in the use of digitizing techniques and powerful computers that has taken place during the most recent years. The size and duration of the project was expected to be very considerable, and it was therefore very comforting that the response to the first circular letter which was mailed at the end of September 1991 in every respect surpassed our expectations.

At the 21st General Assembly, resolutions A-8 and C-11/14 (IAU — Information Bulletin, No. 67, 1992) were adopted in support of the WGWFI work and especially about the importance of the astronomical archives. Following this, and at the initiative of the Commission 29 'Stellar Spectra', a parallel project on 'Archiving and Distribution of Spectroscopic Data', which includes wide-field objective prism photographs, was started last December.

Here it is necessary to mention that the beginning of the work on the creation of a global astronomical plate archive was begun already in 1980 on the initiative of B. Hauck (1982, 1982a) and resulted in a first list of existing astronomical plate archives. In this list, there are 42 institutes/observatories, and 36 of these announced that they possessed astronomical plate archives, but without distinguishing between the wide-field direct plates and the spectroscopic ones.

The main difficulty of the work of a plate archive creation for inclusion in the CDS/SIMBAD or other astronomical data centres was that only 6 of these plate archives were in suitable form for the computer processing in 1982.

In 1986 C. Jaschek started a general programme in the 'Centre de Données Stellaires', Strasbourg, connected with the collected information about the archives of astronomical observations in different branches of activity. From 141 answers of Jaschek's questionnaire (Jaschek 1988, 1989) all over the world 68 institutes (about 50%) declared they possess photographic plate archives. Among the declared archives only 20 were in the complete or not fully complete computer readable form. There are no differences between the wide-field direct plates and the simple 'narrow-field' ones listed in the questionnaires. As a summary Jaschek (1989a) evaluated that the majority of the archives are still not computer readable and much remains to be done. He concluded regrettably that the archiving is not regarded in the astronomical circles as important.

However, thanks to Hauck's and Jaschek's important works, there has been a considerable success of the present, renewed effort to document the existing photographic plate archives. Today there are some new positive moments in comparison with the archive work from 10 years ago:

- the wider use in the astronomical photographic observations of computer processing techniques, and
- greatly improved possibilities for the digitisation and retrieval of the photographic material and the creation of the Data Base for this purpose.

The existence of some well-known centres, e.g. Baltimore (STScI), Minnesota, Edinburgh, ESO, Muenster, Paris, Tokyo, etc., for the digitisation of the mentioned plate archives is here of special interest and it is quite likely that a future, joint project may lead to the large-scale digitisation of many of the plates in the archives, thereby justifying and further validating the Data Base project now begun, cf. e.g. Lasker et al., 1990; Jenker et al., 1990; MacGillivray and Beard, 1989; Cannon, 1989; Crane, 1984; Horstman et al., 1989; Humphreys and Penington, 1989; Guibert and Moreau, 1991; Ishida, 1987.

2. A List of Existing Wide-Field Instruments

The existence and use of wide-field plates have always been closely connected with the activity of the various wide-field telescopes — Schmidt, Astrographs, 'fast' Cameras, Ritchey-Chrétien type, etc. and has been vital for the progress in photography as a method to record the astronomical observations since the end of last century.

The search for astronomical archives forced us first to make a list of wide-field instruments used for obtaining the plates in these archives at the different observatories. During the data collection, papers by Bahner (1965), West (1974), Wolf (1981), Ponomariov (1987), Bräuer and Fuhrmann (1992), Hazen (1992), were used, as well as the information obtained from various astronomers (their names are given in Table 1) who answered the first circular letter. The data received for individual archives shows that there have been results from astronomical observations carried out with at least 174 wide-field instruments since 1889. We can add to this number the data for 51 instruments at 34 observatories which have not yet declared the availability of their astronomical archives. The list of these instruments form the fundamental basis for the present work on astronomical archiving.

The main characteristics of the instruments listed (Table 1) and the coordinates of observatories will be useful in the case of creation of future global lists of all existing wide-field plates and their future data base.

The distribution of the wide-field instrument aperture versus years of the operation beginning is shown in Fig. 1. This information will of course be corrected when more details of the telescope parameters are received, because in some cases we have only preliminary information for them. The crosses in Fig. 1 denote the instruments not yet included in the first list of wide-field plate archives. The 4-m Ritchey-Chrétien Kitt Peak and 3.9-m Anglo-Australian telescopes, in operation from 1973 and 1975 respectively, are beyond the figure border.

3. A Preliminary List of Wide-field Plate Archives (WFPA)

In order to make the first WFPA list, more than 200 astronomical observatories/institutes all over the world were contacted and accordingly informed by means of a circular letter sent out in September 1991. We mainly used the directory of the addresses of professional observatories listed in the STARCAT (OBS.LIST) (1991), American Astronomical Society – Membership Directory (1991) and the Astronomical Almanac (1991). Our ambition was to have in these initial activities also those observatories and institutes which have no wide-field instruments, but which have participated in photographic work and have been connected with sky surveys or wide-field monitoring programmes. This campaign to inform the world-wide astronomical community also had as a goal to draw the attention of the individual astronomers who possess wide-field plate archive collections within the established rights of using observing materials.

As a result of this circular letter, 63 answers were received. They are summarized in Table 1, of which the successive columns indicate:

1 & 2 Location of Observatory/Institute and a brief description, mainly according to the list of observatories in the Astronomical Almanac (1992);

3 & 4 East Longitude and Latitude;

5 Elevation of the Observatory/Institute above sea level;

6 - 9 Telescope parameters: Clear aperture (m), diameter of the mirror (m), focal length (m) and scale (arcsec);

10 Type of the telescope(s) used: Sch - Schmidt, Ast - Astrograph, Cam - Camera, Rfl - Reflector; RCr - Ritchey-Chrétien.

11 Field of the telescope (degrees);

12 Year of the beginning of operation or the time of possession of the plate archives;

13 Information about the type of archive: Plates or (F)ilms;

14 & 16 Number of direct and objective prism plates/films;

15 & 17 Information about listings of the archived plates/films: (T)able form, (C)omputer

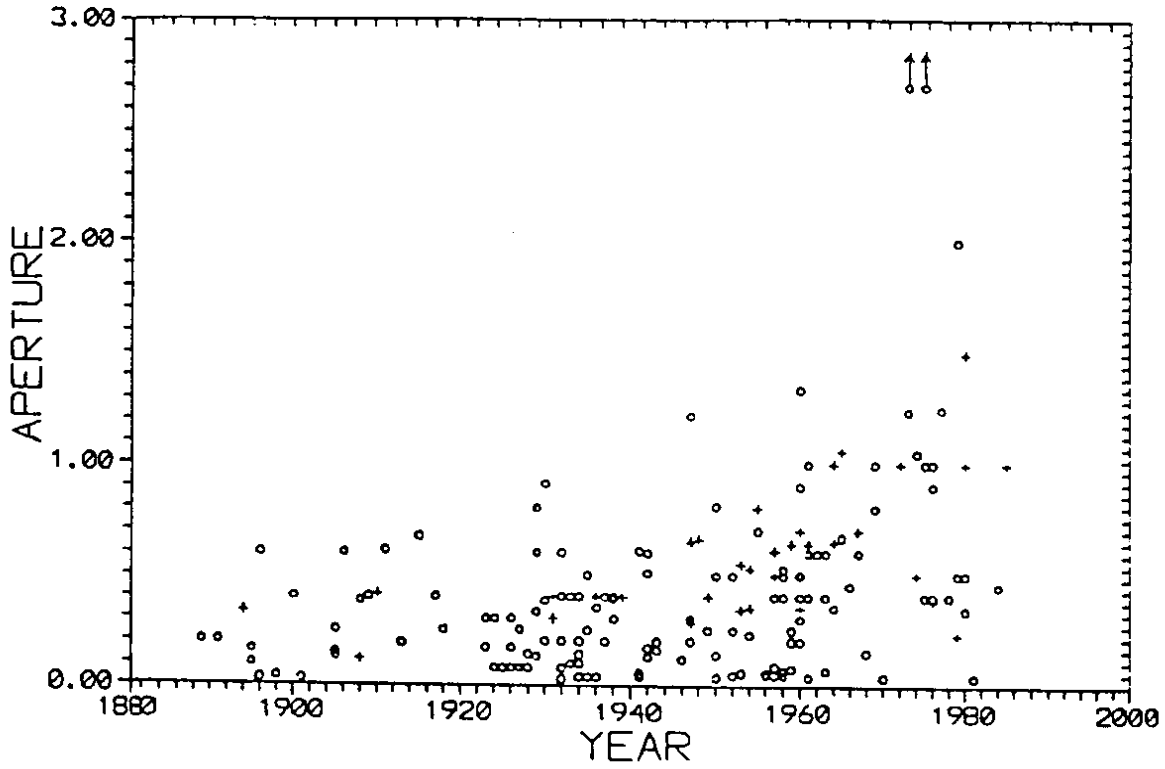

Figure 1. Distribution of the Wide-Field Instrument Aperture versus Year of the Operation Beginning. The 4-m Ritchey-Chrétien Kitt Peak and 3.9-m Anglo-Australian telescopes respectively in operation from 1973 and 1975, are beyond the figure border.

readable form, or (TC) — table form and not complete computer readable form;

18 Name of the astronomer responsible for the plate archive or of the director of the institute/observatory.

3.1 The Tables

3.1.1 Table 1

14 of the answers received were negative and 49 observatories/institutes listed declared that they possess in total more than 1.3 x 10^6 wide-field astronomical plates.

In Table 1 the considerable progress in the archiving of the observations in comparison with the situation 10 years ago is obvious. Today, 116 archives (connected with different telescopes) are in complete computer readable form (15) or in the process of preparation. The availability of 174 archives makes the beginning of work on creation of the wide-field data base much more attractive and realistic. From the separate archives listed in the Table, only 10 are not presented even in table form and their archiving is a separate question which must be taken up during a subsequent stage.

In Fig. 2 the distribution of the number of plates in the declared plate archives listed in Table 1 versus aperture of the wide-field telescope used is shown. Beyond the figure border there are the archive of the 4-m Ritchey-Chrétien Kitt Peak telescope (5000 plates) and the very rich Sproul, Harvard and Boyden (Harvard-Arequipa) collections, with 100,000, 60,000, and 48,000 plates respectively.

Table 1. First List of Astronomical Observatories/Institutes Possessing Wide-field Plate Archives.

Location	Description	East Long.	Lat.	Height (Sea Level)	Telescopes: Clear Apert.	Apert. Mir.	Focal Leng.	Scale "/mm	Type	Field Deg.	Year of Oper.	P / F	Plates/Films: Direct		Sp.		Astronomer
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Asiago,Italy,	Asiago Astroph. Obs	+ 11 31.7	+45 51.7	1045	0.67	0.92	2.15	96	Sch	5.3	1965		15050	TC	680	TC	R.Barbon
Asiago,Italy	Asiago Astroph. Obs	+ 11 31.7	+45 51.7	1045	0.40	0.50	1.00	206	Sch	6.8	1958	F	18301	TC	2006	TC	R.Barbon
Austin,Texas	Uni. Texas(Bloemfontain)	+ 26 24.3	-29 02.3	1771	0.25			167	Cam	15.0	19..				400	T	K.Henize
Basle,Schvitzerland	Astr. Inst(Palomar Obs)	-116 51.8	+33 21.4	1706	1.22	1.83	3.07	67	Sch	6.5	1947		1000	T			R.Fenkart
Brooklin,Indiana	Goethe Link Obs(Lovvell Obs)	- 86 23.7	+39 33.0	300	0.25		1.72	120	Ast	5.7			6000	T			B.Skiff
Brorfelde,Denmark	Copenhagen Univ. Obs	+ 11 39.9	+55 37.3	90	0.45	0.77	3.00		Shm	5.3	1966		1400	T	600	T	K.Augustesen
Bucharest,Romania	Bucharest Ast. Obs	+ 26 05.8	+44 24.8	81	0.38		6.00	34	Ast	2.0	1930		12000	T			G.Bocsa
Byurakan,Armenia	Byurakan Astroph. Obs	+ 44 17.5	+40 20.1	1500	1.00	1.50	2.13	97	Sch	4.0	1961		20000	T	1000	T	G.Oganian
Byurakan,Armania	Byurakan Astroph. Obs	+ 44 17.5	+40 20.1	1500	0.53	0.53	1.83	113	Sch	5.0	1958		20000	T			G.Oganian
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.03		0.15	1200	Rfr	60.0	1901		30000	TC			M.Hazen
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.04		0.30	600	Rfr	40.0	1898		32000	TC			M.Hazen
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.04		0.15	1200	Rfr	60.0	1936		11000	TC			M.Hazen
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.08		0.50	391	Rfr	22.0	1928		4000	TC			M.Hazen
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.20		1.30	163	Rfr	8.0	1889		60000	TC			M.Hazen
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.30		2.10	97	Rfr	5.0	1923		5000	TC			M.Hazen
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.40		2.10	98	Rfr	5.0	1909		26000	TC			M.Hazen
Cambridge,Massachusetts	Harvard Collegve Obs	- 71 07.8	+42 22.8	24	0.60		3.40	60	Rfl	1.6	1906		4000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.03		0.15	1200	Rfr	60.0	1932		11000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.04		0.40	580	Rfr	40.0	1961		7000	TC			M.Hazen

Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.04		0.30	600	Rfr	40.0	1934	10000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.08		0.50	391	Rfr	22.0	1932	12000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.10		0.70	290	Rfr	15.0	1933	5000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.20		1.30	162	Rfr	8.0	1934	13000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.30		2.10	97	Rfr	5.0	1938	4000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.40		2.10	98	Rfr	5.0	1932	14000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.60		3.40	60	Rfl	1.6	1932	2000	TC			M.Hazen
Cambridge,Massachusetts	Oak Ridge St., Harvard Obs	- 71 33.5	+42 30.2	185	0.60		2.10	98	Sch	5.0	1942	5000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St., Arequipa, Peru	- 71 33.0	-16 22.5	2451	0.03		0.30	600	Rfr	40.0	1896	16000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St., Arequipa, Peru	- 71 33.0	-16 22.5	2451	0.08		0.30	700	Rfr	40.0	1924	2000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St., Arequipa, Peru	- 71 33.0	-16 22.5	2451	0.20		1.10	179	Rfr	10.0	1891	48000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St., Arequipa, Peru	- 71 33.0	-16 22.5	2451	0.25		1.20	167	Rfr	9.0	1918	7000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St., Arequipa, Peru	- 71 33.0	-16 22.5	2451	0.60		3.40	60	Rfr	5.0	1896	14000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.04		0.40	580	Rfr	40.0	1970	1000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.04		0.30	600	Rfr	40.0	1935	12000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.04		0.15	1200	Rfr	60.0	1941	6000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.08		0.50	390	Rfr	22.0	1928	17000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.08		0.30	700	Rfr	40.0	1927	3000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.20		1.10	179	Rfr	10.0	1930	23000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.25		1.20	167	Rfr	9.0	1927	30000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.60		3.40	60	Rfr	5.0	1929	13000	TC			M.Hazen
Cambridge,Massachusetts	Boyden St. Bloemfontain, SA	+ 26 24.3	-29 02.3	1387	0.80		3.00	68	Sch	4.8	1929	7000	TC			M.Hazen
Cambridge,Massachusetts	Mt. John Obs., New Zealand	+170 28.0	-43 59.2	1029	0.04		0.40	580	Rfr	40.0	1981	2500	TC			M.Hazen
Campo Imperatore,Italy	Roma Astronomical Obs.	+ 13 33.6	+42 26.6	2200	0.60	0.90	1.83	113	Sch	6.0	1961	960	T	770 T		G.Baratta
Caussols,France	Calern Obs. CERGA	+ 06 55.6	+43 44.9	1272	0.90	1.52	3.16	65	Sch	5.2	1976	3000	:TC			Ch.Pollas
Caussols,France	Meudon	+ 02 13.9	+48 48.3		0.40	0.60	1.00	206	Sch	10.0	1961 F	3293	T			Ch.Pollas
Caussols,France	Nice(Coted'Azur Obs)	+ 07 18.1	+43 43.4	372	2x0.40		2.00	103	Ast	8.0	1933					Ch.Pollas
Charlottesville,Virginia	Leander McCormick Obs	- 78 31.4	+38 02.0	264	0.67		9.82	21	Rfr	1.1	1915	14500	C			P.Ianna
Charlottesville,Virginia	Leander McCormick Obs	- 78 31.4	+38 02.0	264		1.00	13.75	15	Rfl	1.0	1975	5000	TC			P.Ianna
Charlottesville,Virginia	Leander McCormick Obs	- 78 31.4	+38 02.0	264	0.25		1.15	180	Ast	12.5	1935	4000				P.Ianna
Charlottesville,Virginia	Leander McCormick Obs	- 78 31.4	+38 02.0	264	0.66		10.86	19	Rfr	0.9	19..	7000	TC			P.Ianna
Coonabarabran,Australia	Anglo-Australian Obs.	+149 04.2	-31 16.4	1130		3.90	12.87	16	Rfl	1.3	1975					D. Malin
Coonabarabran,Australia	Anglo-Australian Obs.	+149 04.2	-31 16.4	1130	1.24	1.83	3.07	67	Sch	6.4	1973					D. Malin

Crakov,Poland	Jagellonian Ft.Skala St.	- 19	49.6	+50	03.3	314	2x0.15		0.57	360	Ast	13.0	1968	452	T	M.K.-Winiarska
Crakov,Poland	Jagellonian Ft.Skala St.	- 19	49.6	+50	03.3	314	0.35	0.37	3.44	60	Men	1.0	1964	4000	T	M.K.-Winiarska
Crakov,Poland	Astr. Inst(Palomar Obs)	-116	51.8	+33	21.4	1706	1.22	1.83	3.07	67	Sch	6.5		100	T	M.K.-Winiarska
Edinburg, Scotland	Saiding Spring Mtn.	+149	04.2	-31	16.4	1130	1.24	1.83	3.07	67	Sch	6.4	1973	10000	C	S.Tritton
Edinburg, Scotland	Saiding Spring Mtn.	+149	04.2	-31	16.4	1130	1.24	1.83	3.07	67	Sch	6.4	1973 F	750	T	S.Tritton
Edinburgh,Scotland	Royal Obs. Edinburg	- 3	11.0	+55	55.4	146		0.91	16.50	13	Rfl		1930	1500	T	S.Tritton
Edinburgh,Scotland	Royal Obs. Edinburg	- 3	11.0	+55	55.4	146					Sch		1962	3000	T	S.Tritton
Edinburgh,Scotland	Roma Astronomical Obs	+ 13	33.6	+42	26.6	2200	0.60	0.90	1.83	113	Sch	6.0	1967	2000	T	S.Tritton
ESO-Garching, Germany	Cerro La Silla(Chile)ESO	- 70	43.8	-29	15.4	2347	1.00	1.60	3.06	67	Sch	3.6	1969	10000	C	R.West
ESO-Garching, Germany	Cerro La Silla(Chile)ESO	- 70	43.8	-29	15.4	2347	0.40		4.00	51	Ast	2.2	1976	15100	T	R.West
Flagstaff,Arizona	Lovell Obs	-111	39.9	+35	12.2	2204	0.33		1.68	123	Cam	5.7	1929	10000	TC	B.Skiff
Flagstaff,Arizona	Lovell Obs	-111	39.9	+35	12.2	2204	0.13		0.92	225	Cam	6.3	1929	1200		B.Skiff
Flagstaff,Arizona	Lovell Obs	-111	39.9	+35	12.2	2204	DIFFERENT				Cam		1905	250		B.Skiff
Flagstaff,Arizona	Lovell Obs	-111	39.9	+35	12.2	2204	0.13		0.92	225	Cam	6.3	1905	250	T	B.Skiff
Flagstaff,Arizona	Lovell Obs	-111	39.9	+35	12.2	2204	DIFFERENT						1911			B.Skiff
Flagstaff,Arizona	Lovell Obs	-111	39.9	+35	12.2	2204	0.20		0.20	1031	Sch		1932 F	500		B.Skiff
Flagstaff,Arizona	Lovell Obs	-111	39.9	+35	12.2	2204	0.45		3.60	57	Ast		1984	250	TC	B.Skiff
Floarac,France	Bordeaux Univ. Obs	-	31.7	+44	50.1	73	0.33		3.47	59	Ast	2.5		4000	TC	J.Colin
Floarac,France	Bordeaux Univ. Obs	-	31.7	+44	50.1	73	0.38				Cam			200	T	J.Colin
Floarac,France	Bordeaux Univ. Obs	-	31.7	+44	50.1	73	0.33		3.47	59	Ast	2.5		5000		J.Colin
Floarac,France	Bordeaux Univ. Obs	-	31.7	+44	50.1	73	0.33		3.47	59	Ast	2.5		4000	TC	J.Colin
Grosschvabhausen,Germany	Friederich-Schiler Univ.Obs	+ 11	29.0	+50	55.8	356	0.60	0.90	1.80	115	Sch	5.0	1963	1132	T	R.Schielicke
Heidelberg,Germany	Landessternvarte Obs	+ 8	43.3	+49	23.9	570	2x0.40		2.03	102	Ast	8.0	1900	10000	C	G.Klare
Herstmonceux,England	Royal Greenvich Obs	+ 0	20.3	+50	52.3	34	0.25		1.15	180	Cam	15.0	1905	206:	T	R.Catchpole
Herstmonceux,England	Royal Greenvich Obs	+ 0	20.3	+50	52.3	34	0.15		5.57	370	Cam	27.7	1905	100:		R.Catchpole
Herstmonceux,England	Royal Greenvich Obs	+ 0	20.3	+50	52.3	34	2x0.33				Ast	2.0		20000	TC	R.Catchpole
Kiev,Ukraina	Central Astr. Obs	+ 30	29.9	+50	27.2	184	0.40		2.00	103	Ast	8.0	1975	4900	T	L.Pakulyak
Kiso,Japan	Kiso Obs.	+137	37.7	+35	47.6	1130	1.05	1.50	3.25	63	Sch	5.2	1974	6700	C	Y.Nakada

Kitt Peak,Arizona	National Rad. Astr. Obs	-111 36.9 +31 57.2 2084			4.00	11.10	19	RCr	1.3	1973	5000	T			W.Schoening
Kitt Peak,Arizona	National Rad. Astr. Obs	-111 36.9 +31 57.2 2084			0.90	6.80	30	Rfl	1.5	1960	4000	T			W.Schoening
Kitt Peak,Arizona	Warner and Swasey Obs	-111 35.9 +31 57.6 2084	0.61	0.91	2.14		97	Sch	5.2	1941	8008	TC	14000	C	P.Pesch
Madrid,Spain	National Astr. Obs	- 3 41.1 +40 24.6 670	0.40		2.00		103	Ast	8.6	1976	2000	T			J.Lahulla
Mazelspoort,S. Africa	Boyden/Bloemfontein Obs	+ 26 24.3 -29 02.3 1771	0.81	0.90	3.03		68	Sch	4.8	1950					J.McFarland
Merida,Venezuela	Llano del Hato Obs	- 70 52.0 + 8 47.4 3610	1.00	1.52	3.00		69	Sch	5.7	1976	1184	T			N.Calvet
Merida,Venezuela	Llano del Hato Obs	- 70 52.0 + 8 47.4 3610	2x0.51		3.75		55	Ast	6.5						
Mitaka-Shi,Japan	Tokio Astr. Obs	+139 32.5 +35 40.3 62	0.20		1.27		162	Cam	9.2	1943	5000	C			T.Nakamura
Mitaka-Shi,Japan	Tokio Astr. Obs	+139 32.5 +35 40.3 62	0.16		0.79		261	Cam	15.0	1943	"	C			T.Nakamura
Moscov,Russia	Sternberg Astr. Obs	+ 37 32.7 +55 42.0 195	0.16					Cam	20.0	1895	10000	TC			V.Goranskij
Moscov,Russia	Sternberg Astr. Obs	+ 37 32.7 +55 42.0 195	0.10					Cam	20.0	1895	"	TC			S.Shugarov
Moscov,Russia	Sternberg Astr. Obs	+ 37 32.7 +55 42.0 195	0.40		1.60		129	Ast	10.0	1938	21000	TC			V.Goranskij
Moscov,Russia	Sternberg Astr. Obs	+ 37 32.7 +55 42.0 195	0.23		2.30		90	Ast	6.0	1954					
Moscov,Russia	Sternberg Astr. Obs	+ 37 32.7 +55 42.0 195	0.50	0.70	2.00		103	Men	4.5	1958	10000	C			S.Shugarov
Moscov,Russia	Sternb. South St.	+ 34 01.0 +44 43.7 550	0.40		1.60		129	Ast	10.0	1958					
Moscov,Russia	Sternb. South St.	+ 34 01.0 +44 43.7 550	0.50	0.70	2.00		103	Men	4.5	1960					
Mount Kanobili,Georgia	Abastumani Astr. Obs	+ 42 49.5 +41 45.3 1580	0.40		7.60		27	Rfr	1.8	1937	7056	T			D. Chipashvili
Mount Kanobili,Georgia	Abastumani Astr. Obs	+ 42 49.5 +41 45.3 1580	2x0.20		1.00		206	Ast	13.7	1937	1396	T			D. Chipashvili
Mount Kanobili,Georgia	Abastumani Astr. Obs	+ 42 49.5 +41 45.3 1580	0.39	0.44	0.63		330	Sch	8.3	1938	F 30398	T			D. Chipashvili
Mount Kanobili,Georgia	Abastumani Astr. Obs	+ 42 49.5 +41 45.3 1580	0.70	0.98	2.10		98	Men	4.9	1955	20193	T	...	T	D. Chipashvili
Mount Kanobili,Georgia	Abastumani Astr. Obs	+ 42 49.5 +41 45.3 1580		1.25	16.00		13	RCC	0.6	1977	2090	T			D. Chipashvili
Mount Kanobili,Georgia	Abastumani Astr. Obs	+ 42 49.5 +41 45.3 1580	2x0.40		3.00		69	Ast	5.8	1978	4400	T			D. Chipashvili
Mt.Hamilton,California	Lick Obs	-121 38.2 +37 20.6 1290	2x0.51		3.75		55	Ast	6.0	1942	11000	T			A.Klemola
Mt.Hamilton,California	Lick Obs	-121 38.2 +37 20.6 1290	0.13		0.89		233	Cam	18.8	1942		T			A.Klemola
Mount Wilson,California	Mount Wilson(Hale) Obs	-118 03.6 +34 13.0 1742	0.25					Cam	15.0	1952			200	T	K.Henize
Nantucket,Massachusetts	Maria Mitchell Obs	- 70 06.3 +41 16.8 20	0.19		0.86		240	Cam	16.9	1913	8400				E.Friel
Palomar Mt.,California	Palomar Obs	-116 51.8 +33 21.4 1706	1.22	1.83	3.07		67	Sch	6.5	1947	30000	T			R.Brucato

Palomar Mt.,California	Palomar Obs	-116	51.8	+33	21.4	1706	0.46	0.60	0.91	227	Sch				F	10000:	C				E.Helin
Palomar Mt.,California	Palomar Obs	-116	51.8	+33	21.4	1706	0.20		0.20	1031	Sch										
Piikkiö,Finland	Turku-Tuorla Obs	+ 22	26.8	+60	25.0	40	0.50	0.60	1.03	200	Sch	5.5	1980			200	T				L.Takalo
Piikkiö,Finland	Turku-Tuorla Obs	+ 22	26.8	+60	25.0	28		0.50	1.03	200	Rfl	6.7	1935			5000:	T				L.Takalo
Piikkiö,Finland	Turku-Tuorla Obs	+ 22	26.8	+60	25.0	28		0.34	0.69	299	Rfl	10.5	1980			5000:	T				L.Takalo
Pivnice,Poland	Pivnice Astr. Obs	+ 18	33.3	+53	05.8	91	0.60	0.90	1.81	114	Sch	4.5	1962			755	C	2071	C	J.Papaj	
Pivnice,Poland	Pivnice Astr. Obs	+ 18	33.3	+53	05.8	91	0.20				Ast		1949			6000	C				A.Strobel
Poznan,Poland	Poznan Univ. Astr. Obs	+ 16	52.7	+52	23.8	85	0.12		0.53	389	Cam	13.0	1946			797	T				K.Kurzinska
Poznan,Poland	Poznan Univ. Astr. Obs	+ 16	52.7	+52	23.8	85	0.20		3.00	69	Ast	3.5	1947			934	T				K.Kurzinska
Poznan,Poland	Poznan Univ. Astr. Obs	+ 16	52.7	+52	23.8	85	0.30		1.50	138	Ast	6.9	1947			1200	T				K.Kurzinska
Riga,Latvia	Radio-Astroph. Obs	- 24	24.0	+56	47.0	75	0.80	1.20	2.40	86	Sch	5.7	1969	F	19000	T		1700	T	A.Alksnis	
Rozhen,Bulgaria	National Astr. Obs	+ 24	45.0	+41	43.0	1760	0.50	0.70	1.72	120	Sch	4.5	1979			6060	C	70	C	M.Tsvetkov	
Rozhen,Bulgaria	National Astr. Obs	+ 24	45.0	+41	43.0	1760		2.00	16.00	13	RCr	1.0	1979			1800	TC				M.Tsvetkov
Rozhen,Bulgaria	ESO, La Silla	- 70	43.8	-29	15.4	2347	0.40		4.00	52	Ast	2.2	1985			100	T				M.Tsvetkov
Rozhen,Bulgaria	Byurakan Astroph. Obs	+ 44	17.5	+40	20.1	1500	1.00	1.50	2.13	97	Sch	4.0	1973			400	T	50	T	M.Tsvetkov	
Rozhen,Bulgaria	Byurakan Astroph. Obs	+ 44	17.5	+40	20.1	1500	0.53	0.53	1.83	113	Sch	5.0	1973			150	T				M.Tsvetkov
Saint Michel,France	Obs. de Haute-Prvence	+ 05	42.8	+43	55.9	655	0.62	0.90			Sch	4.4				7054	TC				P.Veron
Saint Michel,France	Obs. de Haute-Prvence	+ 05	42.8	+43	55.9	655	0.30	0.41			Sch	7.7		F	5442	TC				P.Veron
San Juan Obs., Argentina	Felix Aguilar Obs.	- 68	37.2	-31	30.6	700	0.50		3.41	55	Ast	6.0			6000:	T				C.Lopez	
SAO,Russia	Byurakan Astroph. Obs	+ 44	17.5	+40	20.1	1500	1.00	1.50	2.13	97	Sch	4.0	1961					3000	T	J.Stepanian	
Sera la Nave,Sicily	Catania Astr. Obs	+ 14	58.4	+37	41.5	1735	0.33		3.47	59	Ast	2.7				500:	T				S.Cristaldi
Sera la Nave,Sicily	Catania Astr. Obs	+ 14	58.4	+37	41.5	1735	0.44	0.61	1.22	169	Sch	4.2				1000	T				S.Cristaldi
Sonneberg,Germany	Sonneberg Obs	+ 11	11.5	+50	22.7	640	0.17		1.20	170	Cam	9.4	1923			7970	TC				H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+ 11	11.5	+50	22.7	640	0.14		0.70	300	Cam	10.8	1928			6241	TC				H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+ 11	11.5	+50	22.7	640	0.40		1.60	130	Ast	10.8	1938			1658	TC				H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+ 11	11.5	+50	22.7	640	0.40		2.00	100	Ast	8.3	1960			6855	TC				H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+ 11	11.5	+50	22.7	640	0.40		1.60	130	Ast	10.8	1938			10197	TC				H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+ 11	11.5	+50	22.7	640	0.50	0.70	1.72	120	Cam	4.3	1952			8500	TC				H-J.Braeuer

Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.14	0.24	860	Cam	38.2	1928	11166	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.17	1.20	860	Cam	38.2	1926	10275	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.17	1.20	860	Cam	38.2	1942	1325	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.08	0.37	560	Cam	18.7	1925	119	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.08	0.20	1030	Cam	34.3	1926	193	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.10	0.25	830	Cam	27.6	1934	7035	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.06	0.21	980	Cam	32.7	1941	3655	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.35	1.40	150	Rfl	3.3	1936	382	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640		0.18	1150	Cam	38.3	1950	48	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640		0.18	1180	Cam	39.3	1950	204	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.50	0.17	1250	Cam	41.7	1950	2569	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.14	0.70	300	Cam	15.0	1950	1423	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.04	0.18	1150	Cam	38.3	1950	1424	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.30	0.30	690	Sch	11.5	1960	5300	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.20	"	"	"	"	"	"		H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.06	0.21	980	Cam	32.7	1953	3194	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	27.7	1956	11700	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1956	11797	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1956	11794	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.06	0.21	980	Cam	30.0	1956	2781	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1957	10691	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.09	0.30	690	Cam	30.7	1957	682	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	10479	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.07	0.30	830	Cam	30.0	1958	8612	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.07	0.30	830	Cam	30.0	1958	8604	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	8392	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	8385	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	8416	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	8001	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	8014	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	8014	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.05	0.25	830	Cam	30.0	1958	8069	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.07	0.25	830	Cam	30.0	1963	925	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.07	0.25	830	Cam	30.0	1963	942	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.07	0.25	830	Cam	30.0	1963	906	TC	H-J.Braeuer
Sonneberg,Germany	Sonneberg Obs	+	11	11.5	+50	22.7	640	0.07	0.25	830	Cam	30.0	1963	890	TC	H-J.Braeuer
Sonneberg,Germany	Potsdam Obs.	+	13	04.0	+52	22.9	107	0.40	5.50	38	Rfr	1.3	1917	1436	TC	H-J.Braeuer
Sonneberg,Germany	La Paz,Bollvien	-	66	07.5	-16	30.6		0.30	1.50	138	Cam	11.5	1926	915	TC	H-J.Braeuer

Sonneberg,Germany	Windhoek, SW Afrika	+ 17	03.8	-22	35.4	1685	0.14		0.24	860	Cam	43.0	1934	1975 TC	H-J.Braeuer
Sonneberg,Germany	SW Afrika	DIFFERENT					0.05		0.17	1250	Cam	41.7	1952	1912 TC	H-J.Braeuer
Sonneberg,Germany	Boyden Stat., S. Africa	+ 26	24.3	-29	02.3	1387	0.25		1.25	170	Ast	9.4	1959	490 TC	H-J.Braeuer
Sonneberg,Germany	Boyden Stat., S. Africa	+ 26	24.3	-29	02.3	1387	0.20		1.00	210	Ast	11.7	1959	314 TC	H-J.Braeuer
Sonneberg,Germany	Boyden Stat., S. Africa	+ 26	24.3	-29	02.3	1387	0.08		0.30	690	Cam	38.3	1959	95 TC	H-J.Braeuer
Sonneberg,Germany	Heidelberg, Koenigstuhl	+ 8	43.3	+49	23.9	570	0.40		1.95	110	Ast	9.2	1957	1184 TC	H-J.Braeuer
Swarthmore,Pennsylvania	Sproul Obs	+ 75	21.4	+39	54.3	63	0.61		10.93	19	Rfr	0.7	1911	100000 TC	W.Heintz
Tautenburg,Germany	Karl Schvarzschild Obs	+ 11	42.8	+50	58.9	331	1.34	2.00	4.00	52	Sch	3.4	1960	7000 C	S.Marx
Uccle,Belgium	Royal Obs. of Belgium	+ 4	21.5	+50	47.9	105	0.38		3.50	59	Ast	2.0	1908	1160 T	P.Paquet
Uccle,Belgium	Royal Obs. of Belgium	+ 4	21.5	+50	47.9	105	0.30		1.50	138	Cam	9.0	1924	1800 C	P.Paquet
Uccle,Belgium	Royal Obs. of Belgium	+ 4	21.5	+50	47.9	105	2x0.40		2.00	103	Ast	8.0	1934	8000 C	P.Paquet
Uccle,Belgium	ESO, La Silla	- 70	43.8	-29	15.4	2347	0.40		4.00	52	Ast	2.2	1976	4300 TC	P.Paquet
Xingiglong, China	Beijing Astr. Obs	+117	34.5	+40	23.7	870	0.60	0.90	1.80	115	Sch	5.5	1963	3000 C	W.Junjie
Xingiglong, China	Beijing Astr. Obs	+117	34.5	+40	23.7	870	2x0.40		3.00	69	Ast	8.0	1963		

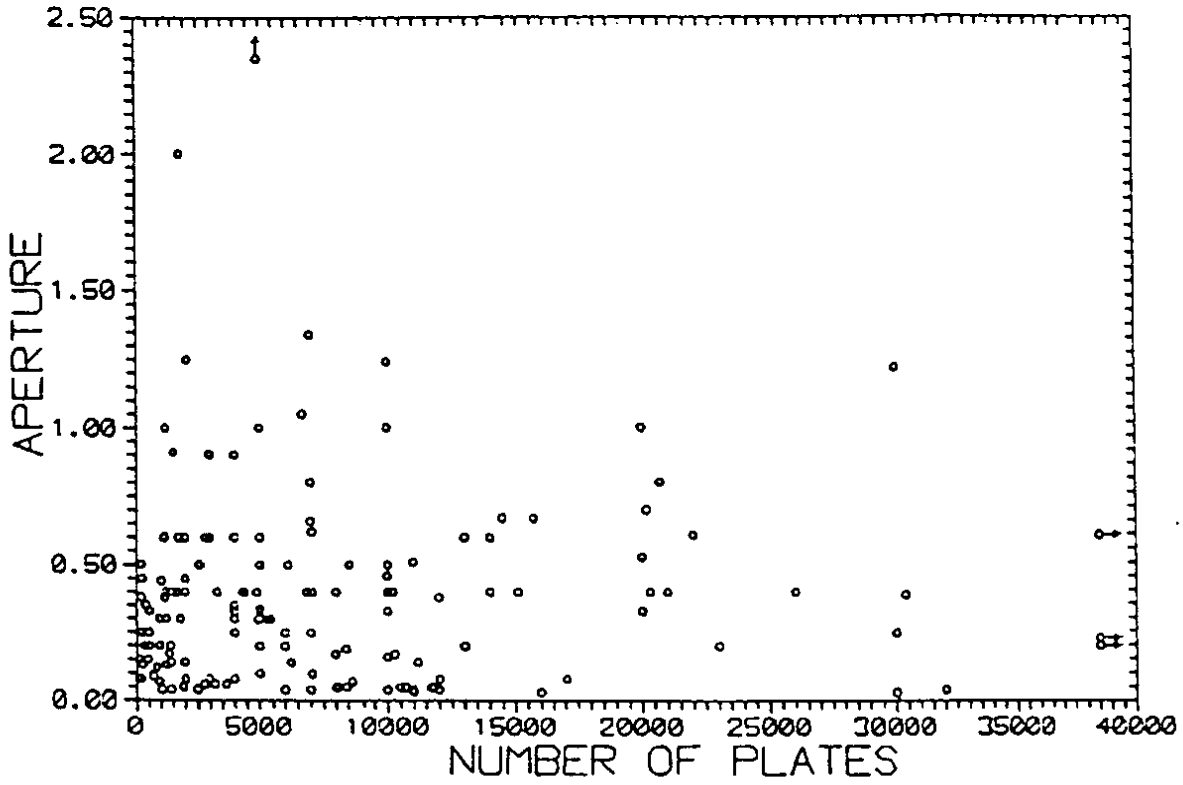

Figure 2. Distribution of the Number of Plates in the Declared Plate Archives listed in Table 1 versus Aperture of the Wide-field telescope used. Beyond the figure border there are the archive of the 4-m Ritchey-Chrétien Kitt Peak telescope (5000 plates) and the very rich Sproul, Harvard and Boyden (Harvard-Arequipa) collections, with 100,000, 60,000 and 48,000 plates respectively.

3.1.2 Table 2

For more completeness 34 observatories/institutions with wide-field instruments not included in the first list are counted in Table 2. We hope that later this year they will also make available the necessary information for their plate archives.

The comparison of our list with B. Hauck's list shows, that in spite of our more specific task — archiving of wide-field plates only — the quantity of the astronomical plates is almost the same.

3.1.3 Table 3

In Table 3 is given the list of institutes which are included in Hauck's list and 10 years ago declared that they have photographic archives, but which have not (yet) been included in our list.

One of the most probable reasons is that in some cases the plate archive is mainly spectroscopic. If so, it will be desirable that they describe their archives and contact Dr. E. Griffin who is now in charge of the parallel project concerning the spectroscopic plate archives under the auspices of the IAU Commission 29.

Table 2. The Institutes and Observatories with Wide-field Instruments not yet included in the first list of WFPA.

Observatory	Wide-field Telescopes			Type	Field Size	Year	Remarks
	Clear Apert.	Apert. Mir.	Focal Length				
1	2	3	4	5	6	7	8
Alma-Ata, Kazakhstan	0.50	0.57	1.20	Men	4.5	1950	
Alma-Ata, Kazakhstan	0.50	0.90	1.80	Men	6.0	1974	
Alma-Ata, Kazakhstan		1.00	13.50	RCC	0.7	1980	Assy-Trugen St.
BBAO, New Zealand/USA	0.20		2.06	Ast	5.0		U.S. NSF, Antarctica
Bosscha Obs. Indonesia	0.51	0.71	1.27	Sch	5.0	1960	
Cambridge, USA	0.41		2.10	Ast	7.0	1910	
Castel Gandolfo, Vatican	0.64	0.98	2.40	Sch	4.5	1961	
Castel Gandolfo, Vatican	0.40		2.00	Ast	8.0	1936	
Cerro Tololo, IAO/AURA	0.61	0.91	2.13	Sch	5.0	1967	Portage Lake Obs.
Cerro Roble Obs, Chile	0.70	0.97	2.10	Men	5.0	1967	Pulkova South St.
Crimean Astr. Obs. Russia	2x0.12			Ast		1908	
Crimean Astr. Obs., Russia	0.64	0.70	0.90	Men	4.5	1959	
Crimean Astr. Obs., Russia	2x0.40		1.60	Ast	10.0	1949	
Derbyshire Obs.	0.35		1.02	Sch	6.0	1976	Bakewell Obs.
Dyer Obs., USA	0.55	0.58	2.08	Sch	5.5	1953	Nashville
Engelgardt Obs., Russia	0.30			Rfr		1931	Kazan Uni. Obs.
Engelgardt Obs., Russia	0.35			Men		1954	Kazan Uni. Obs.
Hamburg Obs., Germany/USA	0.23		2.06	Ast	5.0		

1	2	3	4	5	6	7	8
Hartebeespoort Obs, NL.	2x0.40		2.25	Ast	7.5	1939	Leiden South St.
Hoher List Obs., Germany	0.34	0.50	1.37	Sch	5.0	1953	Bonn Uni. Obs.
Hoher List Obs., Germany		1.06	14.00	RCC		1965	Bonn Uni. Obs.
Las Campanas Obs., Chile		2.00	16.00	RCC	1.5		Carnegie Inst. Obs.
Leningrad Uni. Obs., Russia	0.50	0.57	1.20	Men	4.5		Branch, Armenia
Maidanek, Uzbekistan		1.50	12.0	RCC	1.5		Sternberg Inst. St.
Metsahovy, Finland	0.50	0.90	1.70	Sch			
Mt. Stromlo, Australia	0.50	0.65	1.73	Sch	3.6	1957	
MPI, Calar Alto, Germany	0.80	1.20	2.40	Sch	5.5	1955	
MPI, Heidelberg, Germany	0.25	0.40	0.90	Sch			
Nainital Obs., India		1.00	13.50	RCC	0.7	1980	Utarr Pradesh Obs.
Nassau Stat., Cleveland, USA	0.61	0.91	2.14	Sch	5.2	1957	
Nrdt. Kavkaz St., Russia	0.40		2.0	Ast	8.0	1976	Kazan Uni. St.
Nrdt. Kavkaz St., Russia	0.38			Sch		1976	Kazan Uni. St.
Piszkesteto St., Hungary	0.61	0.90	1.80	Sch	5.0	1963	Konkoly Obs.
Piszkesteto St., Hungary		1.00	13.50	RCC	0.8	1972	Konkoly Obs.
Pulkovo Obs., Russia	0.28		1.50	Cam		1947	
Pulkovo Obs., Russia	0.65		10.50	Rfr		1947	
Pulkovo Obs.	0.15		2.04	Ast	5.0		
Pulkovo St. Bolivia	0.23		0.23	Ast	6.0	1979	
Purp. Mount. Obs., China	2x0.40		2.00	Ast		1963	Nanking Obs.
Purp. Mount. Obs., China		1.00	13.50	RCC	0.7	1985	Nanking Obs.

1	2	3	4	5	6	7	8
Schemaha Obs., Azerbaidzhan	0.35		1.20	Men	4.2	1960	
Schemaha Obs., Azerbaidzhan		0.70	2.82	Rfl		1960	
Stockholm Obs. Sweden	0.65	1.00	3.00	Sch	7.0	1964	Saltsöbaden Obs.
Stockholm Obs., Sweden	0.40		1.98	Ast	8.0	1931	
Tachkent Obs., Uzbekistan	0.33		3.40	Ast	2.0	1894	
Tonantzintla Obs., Mexico	0.66	0.76	2.17	Sch	5.0	1948	
Uppsala Obs., Sweden	1.00	1.35	3.00	Sch	4.5	1964	Kvistaberg
Yunnan Obs., China	2x0.40		2.00	Ast	8.0	1963	Kunmin Obs

Table 3. List of Observatories/Institutes possessing Plate Archives (B. Hauck, 1982) not included in our list.

Observatory/Institute	No. of Plates	Person in Charge
Institut für Astronomie (Tuerkenschanzstr) Wien	3100	A. Schnell
David Dunalp Obs, Richmond Hill, Ontario	46000	C. Bolton
Dominion Astrophysical Obs., Victoria	110,000	E. Lee
Observatoire de Toulouse, France	9012	R. Nadal
Max Plank Institut für Astronomie, Heidelberg	Yes	
Bosscha Observatory, Lembang, Java	7000	B. Hidayat
Osservatorio Astronomico Universitario, Bologna, Italy	19000	F. Bonoli
Osservatorio Astronomico di Brera, Milano, Italy	9000	E. Antonello
Sterrewacht Leiden, Huygens Laboratorium Leiden, NL	30,000	A. Schoemaker
Lund Observatory, Lund, Sweden	3000	
Uppsala Astronomical Observatory, Uppsala, Sweden	Large	
Uni. Michigan Dept of Astronomy, MI, USA	8000	W. Hiltner
Institute for Astronomy, Honolulu, Hawaii	3500	W. Bonsack
Canada-France-Hawaii, Telescope Corporation	300	Director

Observatory/Institute	No. of Plates	Person in Charge
Mount Wilson and Las Campanas Observatory, Pasadena, CA, USA	Yes	Director
Yerkes Observatory, Williams Bay, Wisconsin	150,000	K. Gudworth
SAO, Russia	3300	J. Glagolevskij

3.1.4 Table 4

The data of direct photographic plate archives from Jaschek's (1988, 1989) lists are summarised in Table 4. In this more complete list 68 institutes/observatories declared more than 1.5 x 10^6 photographic astronomical plates. 20 of the archives are in a complete (12) and not complete (8) computer readable form. 24 of the observatories and institutes denoted with "*" are included also in the first list of wide-field plate archives. Among the observatories and institutes not included in our list but present in Jaschek's more than 50% are from Europe.

Table 4. List of Observatories/Institutes possessing direct photographic plate archives according to Jaschek's questionnaires published in *Inform. Bull. B. CDS*, v. 34 and v. 36 (1988, 1989).

Quest. No.	Observatory/Institute	No. of Direct Plates	Years of Operation	Comp. Read. Form	Director or Archivist
1	2	3	4	5	6
1*	Sonneberg Observatory	210,000	1925	no	W. Wenzel
3	University Obs. Goettingen	2500:	1930-40	no	W. Denizer
4*	Warner & Swasey Obs. Case West. Res. Uni.	15000	1941-	no	C. Stephenson
5	M.A.M.A., Paris	yes			J. Guibert
6*	Turku University Observatory	10,000	1935-	no	M.-O. Snare
7*	Lowell Observatory	22000	1895-	yes	B. Skiff
9*	Okayama Astroph. Obs./Tokyo Astr. Obs.	20,000	1960-	no	T. Sasaki
10	Astronomical Inst. "Anton Pannekoek"	1000:	1925-	no	R. Takens
11	Astronomical Inst. "K.U. Leuven"	6500	1957-	no	P. Smeyers
12*	CERGA, France	1900:	1976-	yes	J.-L. Heudier
13	Van Vleck Observatory	30,000	1922-	no	A. Upgren
14	Institute for Astronomy, Vienna	2200:	1909-	yes 20%	W. Weiss
15	Dipartimento di Astr., Uni. di Bologna	....	1939-	yes	M. Zuccoli
17*	Leander McCormick Observatory	50,000:	1914-	yes (-25Mb)	Ph. Ianna
18*	Kiso Observatory, Uni. of Tokyo	5500	1975-	yes	K. Ishida
19	Yerkes Observatory, Uni. of Chicago	15,000	:1900-	no	K. Cudworth
21	University of Hamburg	....	1900-	yes (part)	H. Wendker
22	Astronomiska Observatoriet, Uppsala	14,000:	:1899-	yes	C. Lagerkvist

1	2	3	4	5	6
23*	Swartmore College Obs. Depart. Ph. & Astr.	100,000:	1912-	yes	W. Heintz
24*	Lick Observatory	6000:	1890-1930	no	M. Walker
25	Observatoire de Paris	5600:	1887-1953	no	S. Debarbat
27*	Jena University Observatory	2000:	1963-	no	W. Pfau
28	Hida Observatory, Planetary Section	1300:	1972-	no	T. Akabane
29	David Dunalp Observatory	60,000:	1935-	no	C. Bolton
31*	Tautenburg, Karl-Schwarzschild Obs.	6000	1960-	yes	S. Narx
33	University of South Africa, Pretoria	100:	1984	no	W. Wargau
36	Inst. & Obs. San Fernando, Spain	5186	1891-	no	L. Quijano
37	Dept. Cel. Astr. & Geopf., La Plata, Argentina	120:	1974-	no	J. Muzzio
42	Astr. Inst. Uni. Bern, Switzerland	10,000F	1949-	no	
46	Armagh Observatory	1100	1899-	no	C. Butler
47	USNO, Time Service Department, Washington	32,000	1915-	yes	D. McCarthy
50	USNO, Equatorial Division, Washington	71,000	1951-	no	R. Harrington
52	Flagstaff Station, U.S. Naval Observatory	5000	1963-	yes (part)	H. Ables
54*	Felix Aguilar Observatory, Yale South. St.	5600	1965-	no	C. Lopez
55	Institut für Physics der Erde, Potsdam	2700	1972-	no	
60	Kawasan Observatory, University of Kyoto	4600	1958-	no	K. Iwasaki
62	Astronomy Department, University of Illinois	100:x	1967-	no	K. Yoss
63	Manuel Foster Obs. Uni. Catolica, Santiago	4100	1928-	no	N. Vogt
67	Obs. de Nice, Satellites Artificiales	1300 P/F	1967-75	no	G. Helmer
71	Obs. de Nice, Petites Planets et Comets	10,000	1935-61	no	F. le Guet Tully
74	Centre de Rech. en Astro. & Geophys., Alger	5000:	1885-1960	no	H. Benhallou
75	Astr. Inst. Slovak Academy of Sciences	6300	1943-	no	J. Svoren
82*	Obs. Royal Belgique	12443	1900-	yes	J. Dommanget
83*	Anglo-Australian Observatory	1800	1974-	yes (not comp)	W. Lupton
84	Engelhardt Astr. Obs., Kazan	10,000	1962-	no	O. Belkovich
86	Astroph. Obs. Babelsberg, Potsdam	1000:x	1924-45	no	K. Tiersch
87	Astroph. Obs. Babelsberg, Potsdam	16,000:	1886-1967	no	W. Dick
90*	Harvard College Observatory	400,000	1885	no	M. Hazen
95	Leyden Observatory	13,000:	1910-	no	R. De Poole
96*	Beijing Astronomical Obs.	2000:	1970-	no	Y. Xiang
97*	Felix Aguilar Obs, San Juan, Argentina	50	1977-86	no	Z. Lopez-Garcia
98*	Royal Obs. Edinburgh, UKSTU	13000:	1973-	yes	D. Morgan
99	Max Planck Inst. für Astr., Heidelberg	900:	1976-	yes	Th. Neckel

1	2	3	4	5	6
101*	NOAO, Kitt Peak National Obs.	6000:	1973-	yes	W. Schoening
102*	Abastumani Astr. Obs., Georgia	20,000	1937-	no	E. Kharadze
103	Technische Universität, Dresden	650	1976-	no	K. Steinert
107	Royal Astronomical Society, London	4000:	1800-?	no	P. Hinkley
108	Dyer Observatory, Vanderbilt University	3000:	1955-	no	A. Heiser
109	Bosscha Observatory, ITB., Indonesia	5000:	1948-	no	B. Hidayat
111*	Royal Greenwich Observatory, RGO Archives	130,000:	1646-?	no	A. Perkins
113	Lunar & Planetary Laboratory, Arizona	8000:	1949-65	no	E. Whitaker
114*	Main Astronomical Observatory, Kiev	1300	1949-	no	N. Kharchenko
116	Astronomical Observatory Beograd	2100	1957-59	no	J. Arsenijevic
117	Astronomical Observatory Torun, Poland	18,000	1949-	yes	A. Strobel
118	Astronomical Observatory Beograd	3000	1936-	yes	D. Olevic
129*	South African Astronomical Observatory	8300	1948-	no	T. Evans
134	Riverview College Obs. Lane Cove, Australia		1930-60	no	L. Drake
137	Central Astronomical Observatory, Pulkovo	80,000:	1839-	yes (part)	E. Polyakov
139	Obs. Astronomico de la Uni., Valencia	350	1985-88	no	A. Lopez

*) Included in the first list of Wide-field Plate Archives

4 The WFPA Data Base

The preparation of a list of wide-field plate archives is a necessary step for the creation of the future data base. It is our opinion that the programme should be carried out in three stages:

1. Preparation of a list of the wide-field archives — 1992/93;

2. Computerizing the data base for individual plates in plate archives all over the world — 1993/96.

3. Establishing a Data Bank with digitized wide-field plates — after 1996.

The first stage was begun with the preparation of the first list of Wide-field Plate Archives. It must of course still be made more accurate and complete. We hope to come closer to the goal after sending out and also publishing the second circular letter in the Newsletter No. 2 of the WGWFI. Once it is reasonably complete and has been thoroughly verified, we believe that it may be reasonable to include this list in the STARCAT (1991) and SIMBAD (1992) data bases.

In parallel to this work it is now reasonable to begin with the next stage — the creation of the data base with the data of the individual plates in the plate archives. We expect to do so on the basis of existing ESO/STECF standard. For this purpose it is necessary to create first a global catalogue of all known plates. The form of such a catalogue should present the main information from the separate catalogues of the different observatories in united computer-readable form. Having in mind the recommendation of B. Hauck (1982a) about the information, which ought to be in this catalogue, it would appear that the global catalogue should contain the following information for the general plate parameters:

1. Information about the observatory and the telescope used:
2. Plate/film designation;
3. Equatorial coordinates (R.A., D.) of the field centre (Equinox);
4. Size of the plate or angular size;
5. U.T. date or Julian Date and Local Sidereal Time (LST);
6. Plate type: Direct plate, Multiple exposure, Stellar Tracks or Objective Prism (dispersion), Exposure time, Hypersensitization;
7. Type of emulsion used and filter;
8. Plate storage and availability of the plate, whether it has been copied and/or digitised, and
9. Comments (Quality, Defects, etc.)

It will be advantageous that the organization and the future use of this catalogue will be made according to the conventions adopted for one or more of the existing data bases, e.g. in ESO/STARCAT and Strasbourg (Ochsenbein, 1986; Murtagh, 1988a; Albrecht and Egert, 1991). The modification of the used data base management system (DBMS) will play an important rôle in the efficient progress of the creation of this global catalogue.

The main problem on the way towards the creation of the global catalogue will be to convert the files of existing plate archives from table-forms to computer-readable forms. Since some wide-field plate archives have until now mainly been available in table-form, special attention must be given to this problem. Some observatories have indicated that they have no possibilities at this moment to convert their table-form archives to computer-readable ones. However, the Bulgarian Wide-Field Image Group has some experience and possibilities in preparing the computer-readable plate archives of the Rozhen Observatory and could contribute in this direction. The increasing possibilities of the Network communications among the astronomical institutes all over the world, and the increased use of better and better text scanners for the exchange of the information about wide-field astrophotographs would undoubtedly contribute much towards the compilation of a global catalogue for the future data base.

The last and most important stage (and certainly the most time- and money-consuming!) of the present project is the creation of the DATA BANK for Wide-field Plate Archives. This part of the project organization can only be started after detailed discussions and the availability of firm financial support. Once realized, it will have brought us all the way through to the practical use and rapid retrieval of information contained within the astronomical WFPA.

Only advanced automatization and robotization will bring us to the realization of the DATA BANK access which must then be accessible to all members of the astronomical community. Storage of the information on optical disks, creation of special software for processing the digitized observational material, transfer of the data after processing to the user are only some basic steps which must be passed on the long way towards the DATA BANK of WFPA. The fast progress in the fields of digitization, the development of ever faster computers and data exchange accessories form the basis of our hope that we are now much closer than we have ever been to this final part of the project.

By analysing the data from the Tables above, we can roughly estimate that the total number of all expected wide-field plates is about $2 \cdot 10^6$. If the digitized information on a medium-size wide-field plate is 200 MB, then the total information content of these plates will be about 400 TB (terabytes) or no more than 1 PB (10^{15} bytes). A very rough — and perhaps optimistic! — estimate of the total time needed for the digitization process of all existing wide-field plates is about 2.5 - 5.0 years of uninterrupted work!

To organize, support and access such a large DATA BANK is a question for the future. In this connection the archiving experience at STScI-Baltimore and STECF - ESO during the creation and data retrieval from the Guiding Star Catalogue are good examples from which we can learn how to proceed.

5. Conclusions and Comments

In the present paper we bring some facts and expose some of our ideas on the way towards the creation of a Data Base of Wide-field Plate Archives. At the beginning of the project, the first list of wide-field plate archives has now been compiled. 49 observatories and institutes confirm that they possess a total of 174 WFPA related to different instruments. 15 of them are in fully computer readable form and 101 are in the process of preparation — the basis of a future data base.

At least 34 observatories/institutes possessing 51 wide-field instruments have not declared their wide-field plate archives.

From 68 institutes which declared they had possessed photographic plate archives about 5 years ago, 45 are not included in the first list of wide-field plate archives.

The future progress of the WFPA work will depend on the speed with which the global catalogue of all wide-field plate archives can be achieved, and later on the means which will be available to produce the DATA BANK with all digitized wide-field plates. The rough estimate of the total number of all wide-field plates in existence is about $2 \cdot 10^6$ bytes and the total digitized information for the future DATA BANK may be close to 10^{15} bytes (1 PB).

The creation of the future data base will be closely related to the solution of the major problem of different formats used for plate-digitization. The recent, rapid development of computer techniques and the improved possibilities with the UNIX operating system appear to indicate that the FITS format is probably not the best solution for the future digitization and archiving work of the IAU WG on Wide-field Imaging.

6. Acknowledgements

I would like to thank Richard West for useful suggestions and comments about the WFPA project. I gratefully acknowledge travel grants and financial support for participation in the OC meeting in Baltimore received through the NASA, IAU and ESO, and personal help of Dr. B. Lasker. Many thanks to all colleagues who provided the data for the first wide-field plate archive list.

References

Albrecht, M.A. and Egert, D., 1991, *Databases and On-Line Data in Astronomy*, Kluwer Academic Publishers.

The American Astronomical Society, Membership Directory, 1991.

The Astronomical Almanac for year 1991, Washington/London.

Bahner, K., 1965, Landoldt-Bornstein, NS, Vol. VI/1, p.1.

Barüer, H.-J. and Fuhrmann, B., 1992, *Die Sterne*, **68**, 19.

Crane, P., 1984, *Astronomy with Schmidt Type Telescopes, Proceedings of IAU Colloquium 78*, Asiago, Ed. M. Capaccioli, p.99.

Guibert, J. and Moreau, O., ESO Messenger, 1991, p. 69.

Hauck, B., 1982, *Automated Data Retrieval in Astronomy*, p.217.

Hauck, B., 1982a, *Automated Data Retrieval in Astronomy*, p.227.

Hazen, M., 1992, (private communication).

Horstmann, H., Schuecker, P., Seitter, W., Aniol, R., Budell, R., Cunow, B., Meijer, D., Teuber, D. and Tucholke, H.-J., 1989, *Bull. Inform. CDS*, **37**, 43.

Humphreys, R. and Penington, P.L., 1989, *Bull. Inform. CDS*, **37**, 25.

Information Bulletin of the IAU, 1992, **67**, 40.

Ishida, K., 1987, *Astrophoto*, ed. S. Marx, p.239.

Jaschek, C., 1986, *Bull. Inform. CDS*, **31**, 5.

Jaschek, C., 1988, *Bull. Inform. CDS*, **34**, 159.

Jaschek, C., 1989, *Bull. Inform. CDS*, **36**, 123.

Jaschek, C., 1989a, *Bull. Inform. CDS*, **36**, 151.

Lasker, B.M., Struch, C.R., McLean, B.J., Russell, J.L., Jenker, H. and Shara, M.M., 1990, *A.J.*, Vol 69, No. 1613, 2019.

Jenker, H., Lasker, B.M., Struch, C.R., McLean, B.J., Shara, M.M. and Russell, J.L., 1990, *A.J.*, Vol 69, No. 1613, 2081.
Lasker, B.M., 1992, IAU Commission 9, *WGWFI Newsletter* No. 1, 13.
MacGillivray, H. and Beard, S., 1989, *Bull. Inform.CDS*, **37**, 65.
Murtagh, F., 1988, *Bull Inform CDS*, **34**, 3.
Murtagh, F., 1988a, *Coordination of Observational Projects in Astronomy*, Strasbourg, Ed. C. Jaschek and C. Sterken, p.185.
Ochsenbein, F., 1986, *Data Analysis in Astronomy II, Astronomy from large Databases.*
Ponomariov, D., 1987, "Astronomical Observatories of the USSR", "NAUKA", Moscow.
Russel, C., 1989, *Bull. Inform. CDS*, **37**, 5.
STARCAT, User's Guide, Version 3.3, March 1991.
SIMBAD, User's guide and Reference Manual, III., Release 1.2, April 1992.
Tsvetkov, M., 1992, IAU Commission 9, *WGWFI Newsletter* No. 1, 17.
Wolf, R., 1981, Landoldt-Börnstein, *NS*, Vol VII/1, 1.
West, R., 1974, Conference on research programmes for the New Large Telescopes, ESO/SRC/CERN, Geneva, Ed. A. Reiz, p.321.
West, R., 1983, *Proceedings of the IAU Colloquium No. 78, Astronomy with Schmidt Type Telescopes,* Asiago, Italy, Ed. M. Capaccioli, 13.
West, R., 1991, *Messenger*, No. 65, p.45.
West R., 1992, IAU Commission 9, *WGWFI Newsletter* No. 1, 1.

Dr. M.K. Tsvetkov
Department of Astronomy and
National Astronomical Observatory
Bulgarian Academy of Sciences
Tsarigradsko Shose # 72
BG-1784 Sofia, Bulgaria.