

**Third International School in Astronomy:
Astroinformatics – Virtual Observatory
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Catalogue of Wide-Field Plate Archives

Katya Tsvetkova

**Institute of Mathematics and Informatics,
Institute of Astronomy,
Bulgarian Academy of Sciences**



Definition of Plate Archive

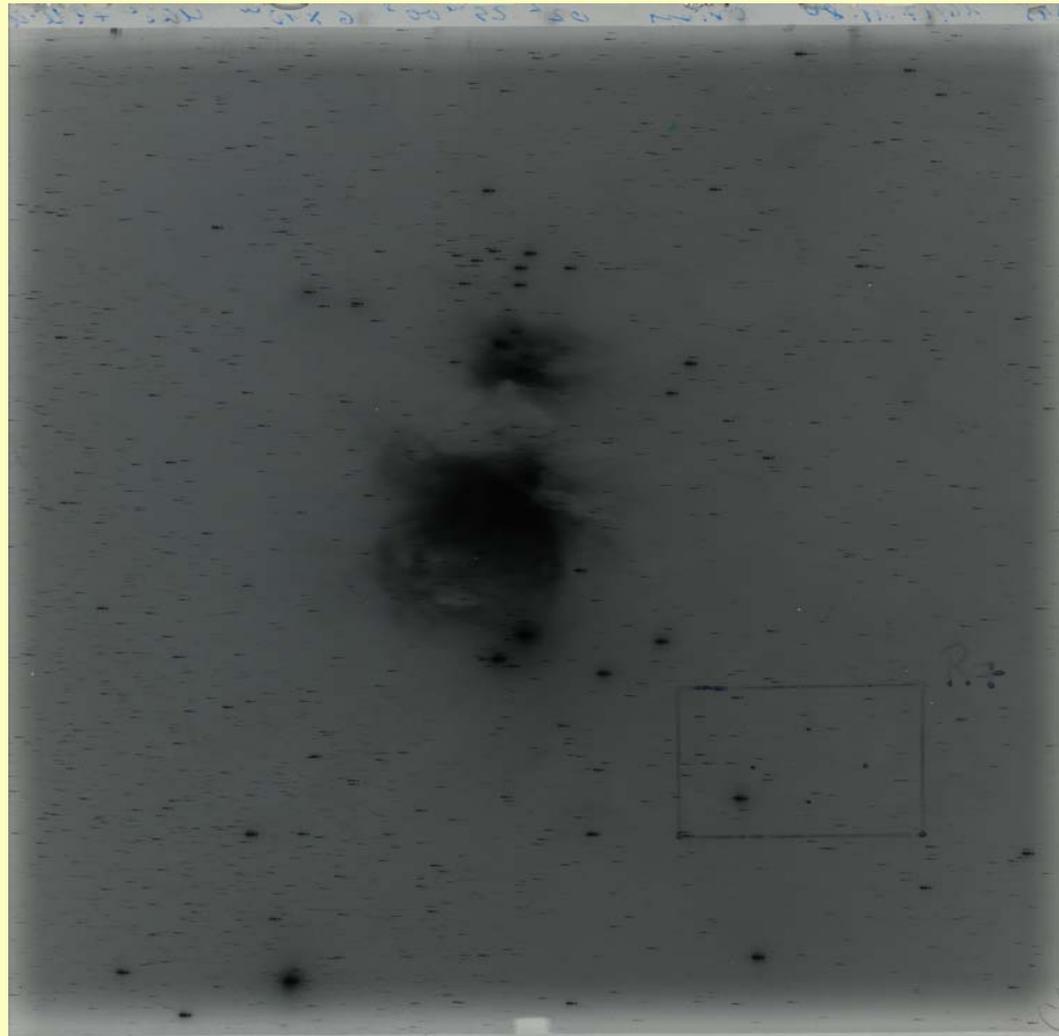
A collection of plates obtained with a definite telescope at a definite observational site and stored at a definite place.

One telescope may have more than one archive, if the telescope was moved or if its plates are stored at different observatories or institutions.

Astronomical Photographical Plates: Examples

ROZ050 000345

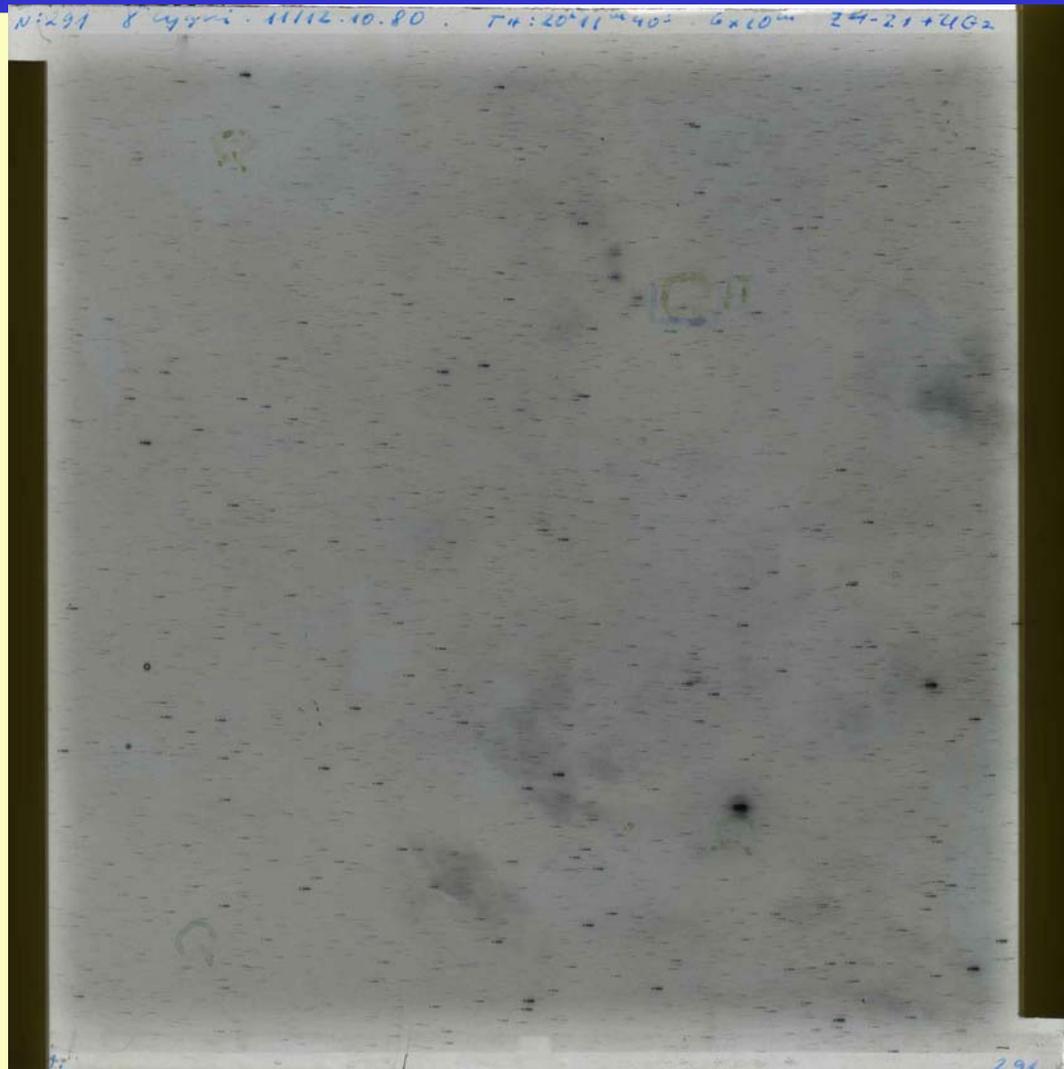
M42/43 region



Astronomical Photographical Plates: Examples

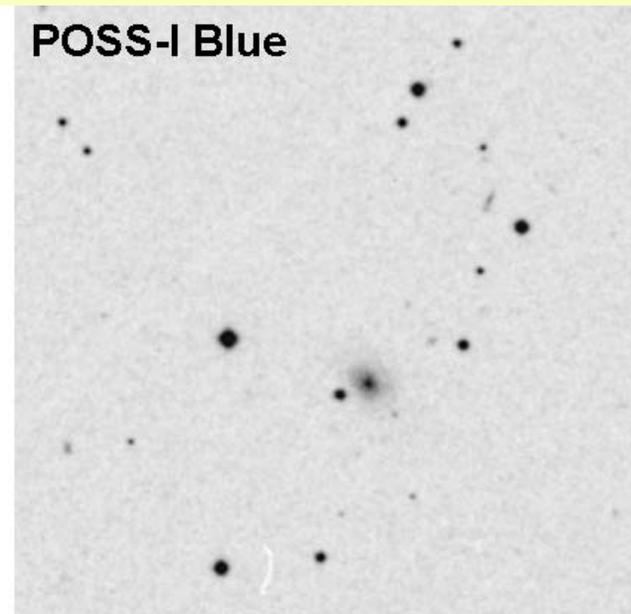
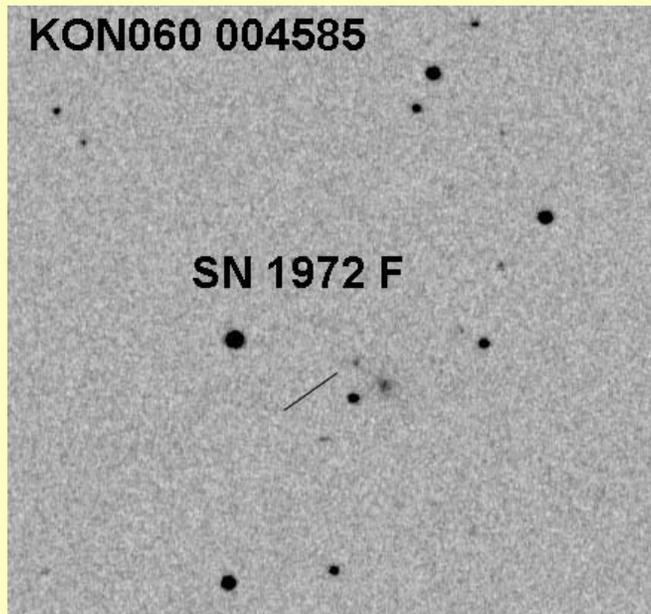
ROZ050 000291

Gamma Cyg region



Astronomical Photographical Plates: Examples

From Digital Plate Archive for Supernova Search at Konkoly
Observatory



Astronomical Photographical Plates: Examples

BEL016A480007 plate (part of the plate), obtained by Milorad Protic on 1948 Jan 10 with image of 1948a comet (Mrkos)

First comet image: 1947 Dec 20

Mrkos Confirmation: 1948 Jan 18



Astronomical Photographical Plates Today

What are the astronomical photographic plates today?

- Scientific heritage representing the previous stage of the present astronomical knowledge.
- Unique source of information for the past of the different astronomical objects.

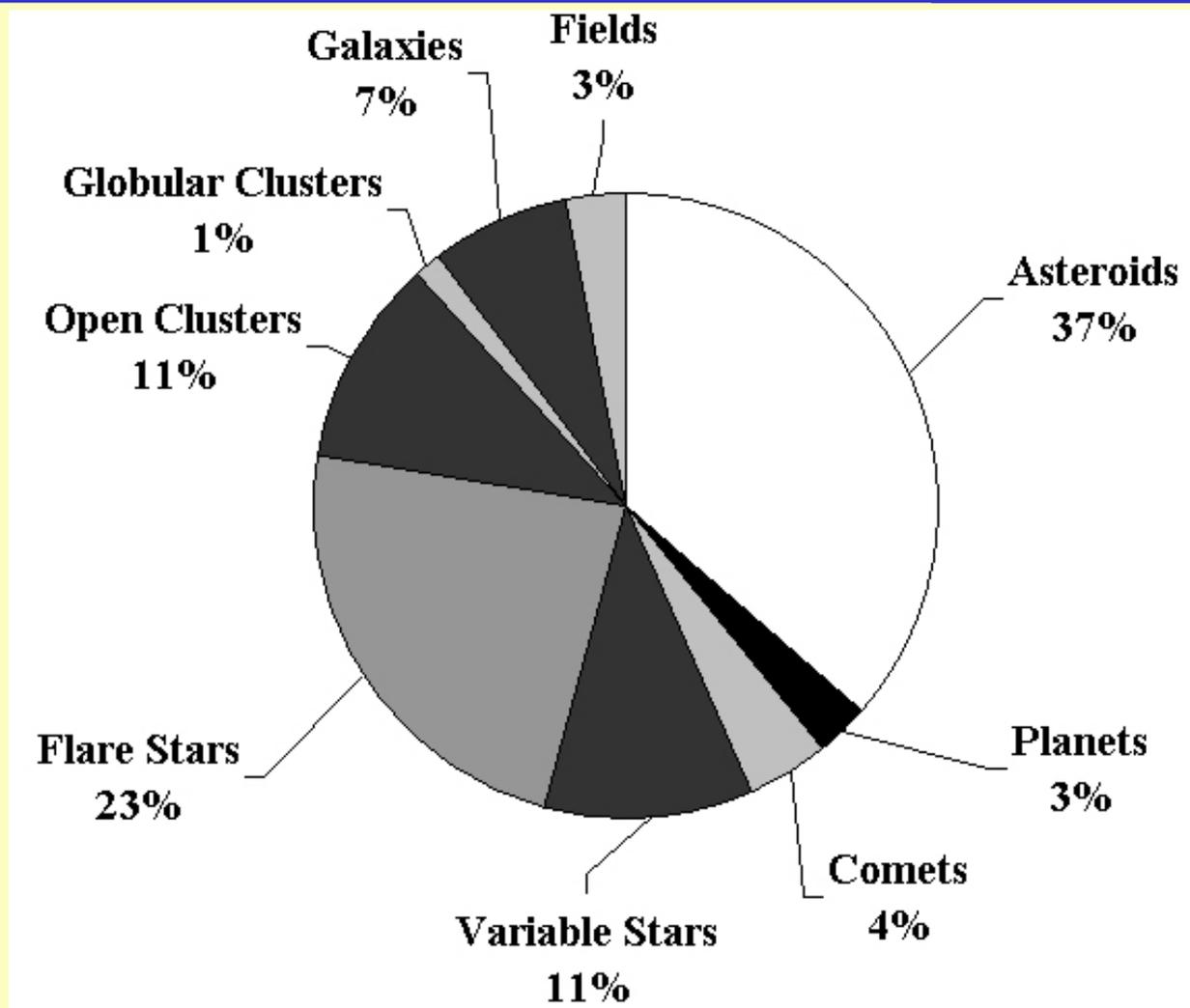
Used Programmes for Plate Observations

- Observations of the major planets and their satellites;
- Small solar system bodies observations (search for new asteroids, astrometric observations of known asteroids and search for satellites of asteroids, photometric determination of the shape and the rotation of asteroids, discovery and past transits of comets);
- Photographic sky surveys;
- Selection of reference stars;
- Artificial satellites observations;
- Observations of stellar occultations;
- Discovery and patrol of variable stars (in the Milky Way and in external galaxies);

Used Programmes for Plate Observations

- Determination of parallaxes of stars,
- Determination of proper motions;
- Astrometric observations for the determination of orbits and parallaxes for binaries,
- Study of the Galaxy structure and kinematics from observations in selected areas (investigations of the emission nebulae and connected stars, spectral classification of the stars and determination of the stellar absorption in the direction of the emission nebulae);
- Search and monitoring of some interesting astronomical objects (AGNs, QSOs, novae and supernovae).

Used Programmes for Plate Observations: WFPDB ROZ050 Archive



Present Exploitation of the Archival Plates:

Compiled List of Astronomical Tasks and Results

- Composed light curves of different variable stars for as long as is possible time period;
- Search for long-term brightness variations;
- Search for past eruptions of a pre-main sequence star;
- Observations of small solar system bodies;
- Search for optical analogues of Gamma Ray Bursts;
- Search for photometric variability of quasars;
- Supernovae search in digitized archives;
- Present use of Carte du Ciel plates

Plate Libraries: Rozhen Observatory



Plate Libraries: Sonneberg Observatory



First Lists of Observatories/Institutes Possessing Plate Archives

No restriction on the Telescope Field:

B. Hauck B. (1982) *Automated Data Retrieval in Astronomy* 217.

B. Hauck B. (1982) *Automated Data Retrieval in Astronomy* 227.

C. Jaschek (1989) *Bull. Inform. CDS* **36** 123.

C. Jaschek (1989) *Bull. Inform. CDS* **36** 151.

Only Wide-Field (>1) Plates:

M. Tsvetkov (1991) *IAU WGWFI Newsletter* **1**, Ed. H. T. MacGillivray
17.

Catalogue of Wide-Field Plate Archives : Content

1. WFPDB instrument identifier;
2. Information for inclusion of the archive into the WFPDB;
3. Original name of the telescope;
4. Location of the plate archive (Site, Country);
5. Observatory (Name, Site, Country);
6. Marsden's number of the observatory;
7. Time zone;
8. Observatory Coordinates: (East Longitude, Latitude, Altitude);

Wide-Field Plate Archives Catalogue: Content

9. Clear aperture of the telescope;
10. Diameter of telescope mirror;
11. Focal length;
12. Plate scale;
13. Instrument type;
14. Field;
15. Years of telescope operation;
16. Symbol "F" for "film", blank for "plate“;
17. Number of direct plates;

Catalogue of Wide-Field Plate Archives: Content

18. Orig.Plate Number from.. to..
19. Number of direct plates;
20. Form of the archive data for the direct plates (T, C, CT);
21. Number of objective prism plates;
22. Form of the archive data for the objective prism plates (T, C, CT);
23. Quality of the plate archive: A - very good, B - good, D – distributed;
24. Astronomer in charge.

Information for Given Plate Archive in the WFPDB: ROZ050 Archive



Wide-Field Plate Database - Sofia

[WFPDB](#)WFPDB@VizieR[Aladin](#)[Other Plate Catalogues](#)[Access Log](#)[Help](#)

Details for archive: ROZ050

Location of the Archive:

Site: **Sofia**

Country: **Bulgaria**

Observatory:

Name: **Rozhen NAO**

Site: **Rozhen**

Country: **Bulgaria**

Time zone: +2 h

East longitude: 24° 45.0'

Latitude: 41° 43.0'

Altitude: 1760 m

Clear aperture: 0.50 m

Mirror diameter: 0.70 m

Focal length: 1.72 m

Scale: 120 "/mm

Type: Sch

Field size: 4.5°

Years of operation:

From: 1979

To:

P/F:

Number of direct plates: 7335

Archive type: C

Number of spectral plates: 214

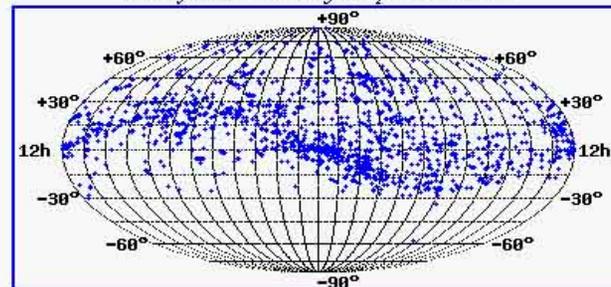
Archive type: C

Number of plates in WFPDB: 7359

Quality: D

Astronomer in charge: [M.Tsvetkov](#)

All-sky distribution of the plate centres:



Catalogue of Wide-Field Plate Archives: Summary

Plate Observations: in 160 observatories;

Storage of Plates: in 114 observatories/institutions;

Number of Archives (2010): 473;

Direct Plates: 2 396 555;

Spectral Plates: 79 081;

Total: 2 475 636.

Observatories Where the Wide-Field Plate Archives Were Made

Observatories: 160.

Location: Northern hemisphere: 119

Southern hemisphere: 41

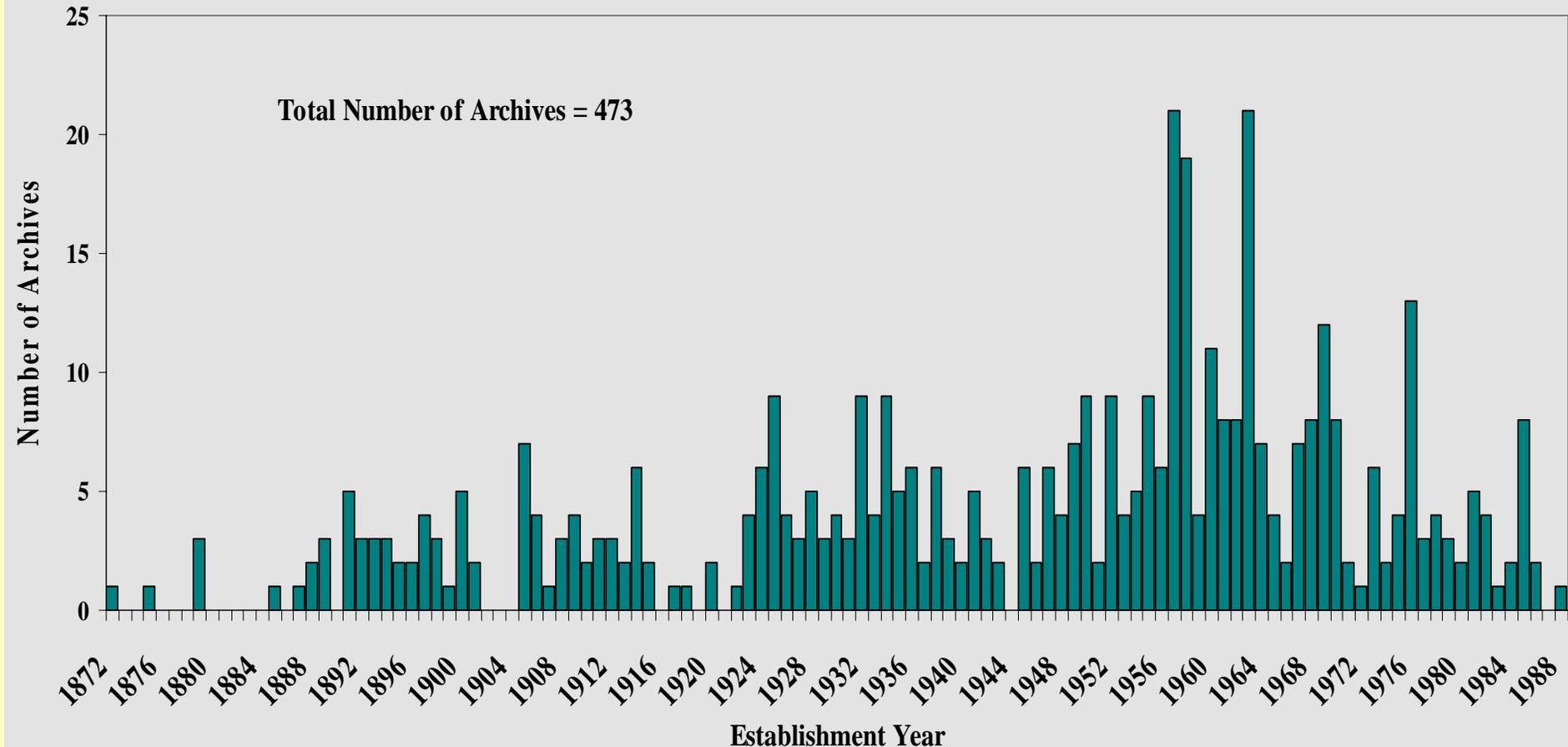
Altitude: from 10 m (Cape of Good Hope Obs., Cape Town, South Africa) up to 3610 m (Llano del Hato, Merida, Venezuela).

Telescopes Produced Wide-Field Plate Archives: Years of Operation

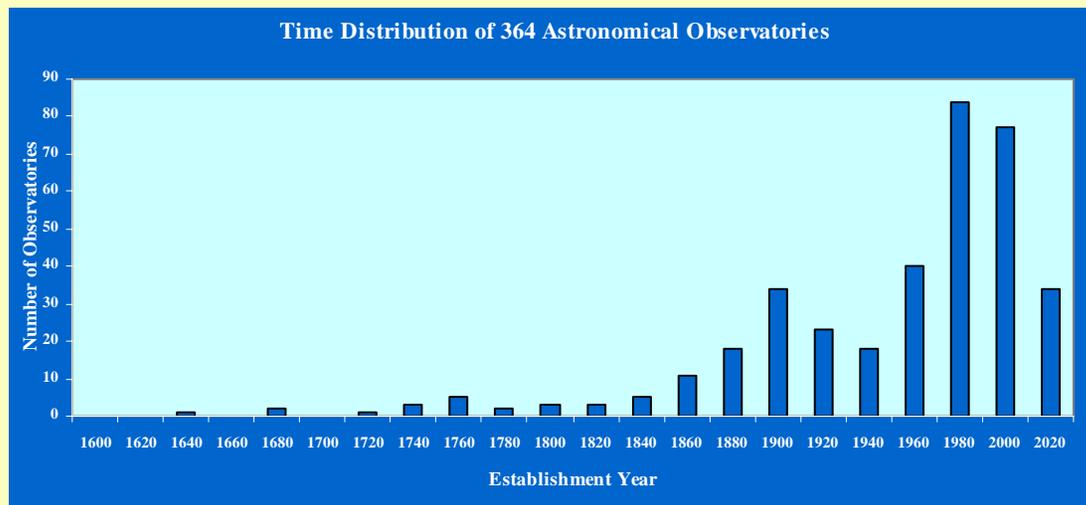
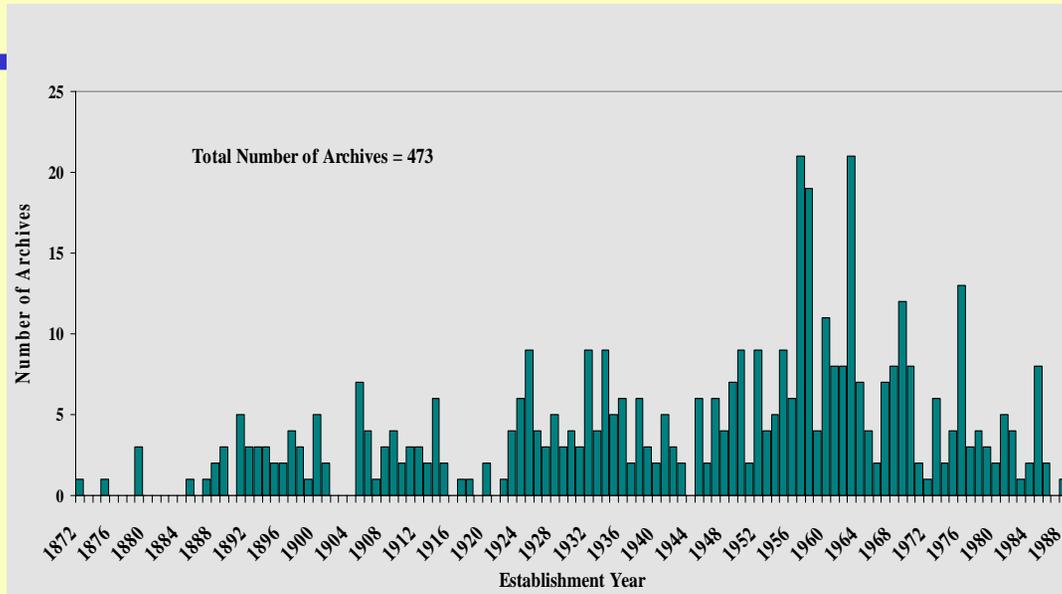
Beginning: Period from 1872 (for COR029) up to 1988 for EAO020
– Elgelhardt Obs. Kazan, Russia.

End: Period from 1873 (for COR029) up to 2005 (for
GUA040E – Main Astr. Obs. Kyiv, Ukraine, and
BUC038, Ast. Institute, Bucharest, Romania).

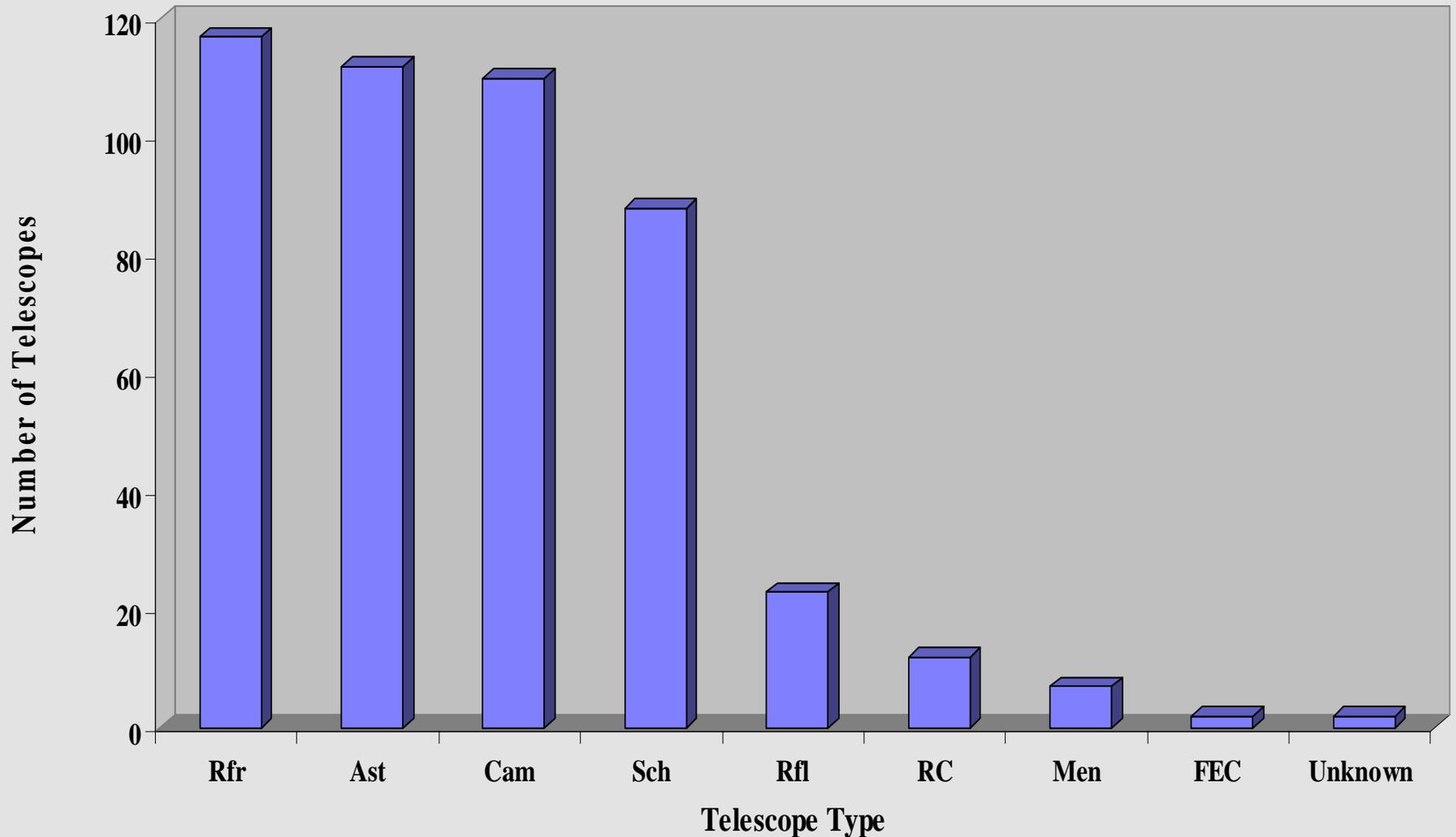
Establishment of Plate Archives in Different Observatories



Comparison: Establishment Year of the Observatories/Plate Archives



Telescopes Produced Wide-Field Plate Archives: Type

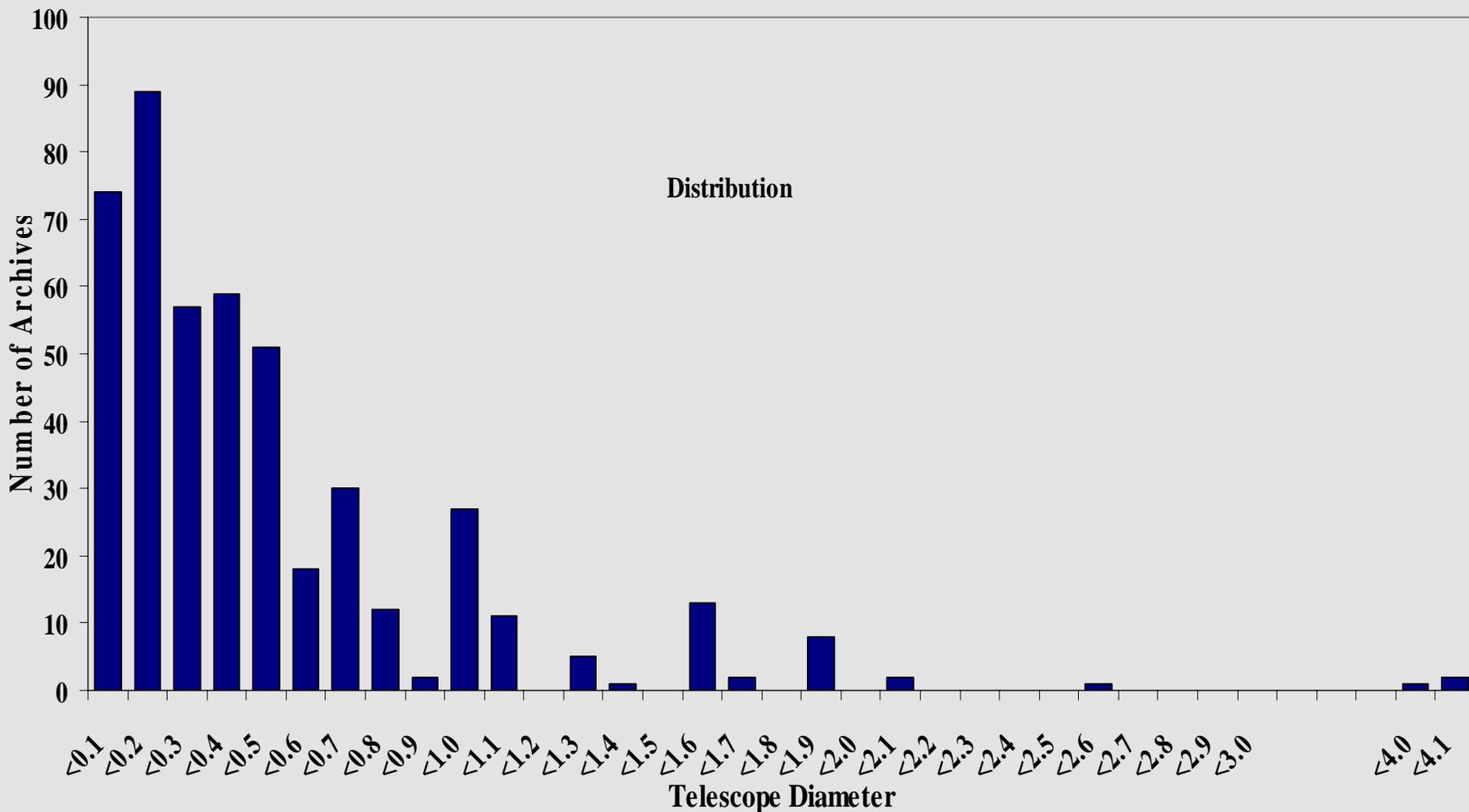


Telescopes Produced Wide-Field Plate Archives: Lens or Mirror Diameter

Diameter size:

- Meteor patrol cameras 0.01m in Harvard or in Ondrejov FEC
- 3.9m in Coonabarabran, Anglo–Australian Obs.
- 4.0m in Kitt Peak Obs.
- 4.0m in Inter-American Observatory in Cerro Tololo.

Telescopes Produced Wide-Field Plate Archives: Lens or Mirror Diameter



Telescopes Produced Wide-Field Plate Archives: Field

Field size: from 1° up to 180° (FEC OND001A)

Exceptions less than 1° : too many plates obtained:

1. PUL065, Pulkovo, Russia, 0.9° , 18 600 plates.
2. SPR061, Sproul Swarthmore, USA PA, 0.8° , 100 000 plates.

No exact information: for 44 archives

Telescopes Produced Wide-Field Plate Archives: Scale

Scale: from 11"/mm up to 6876 "/mm (FEC OND001A)

No exact information: for 26 archives

Telescopes Produced Wide-Field Plate Archives: Scale

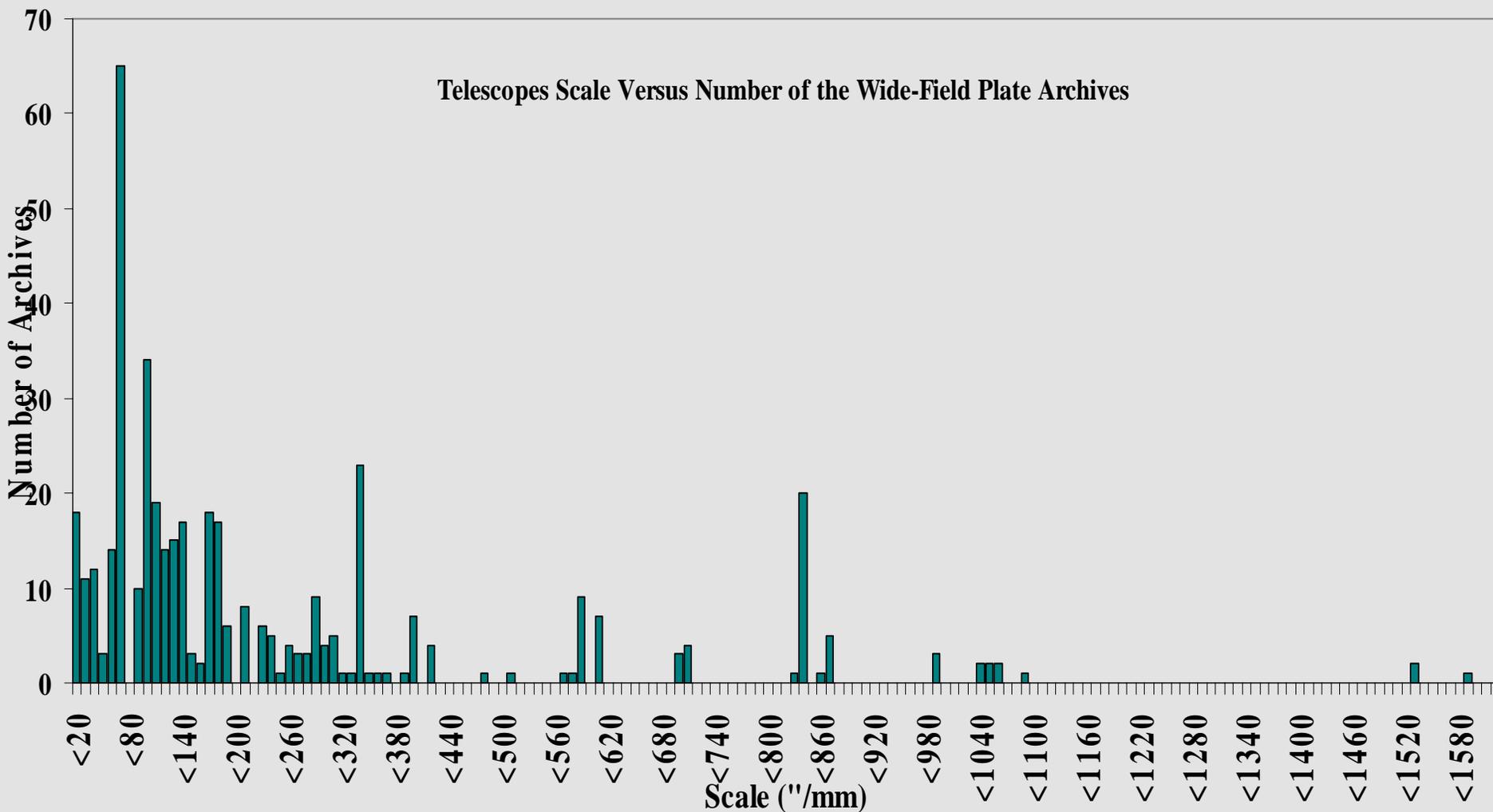


Plate Archives: Countries Possessing Archives

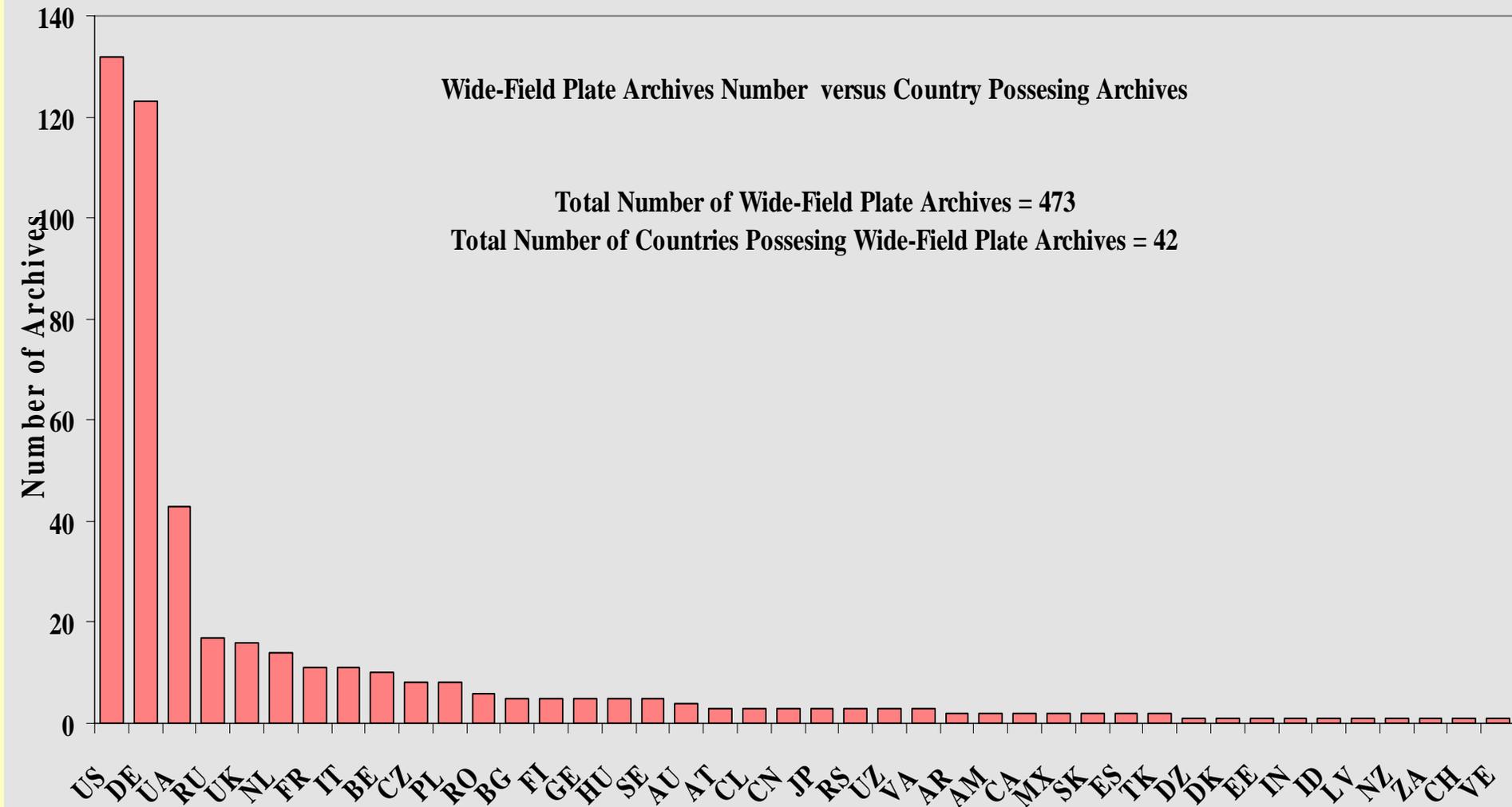
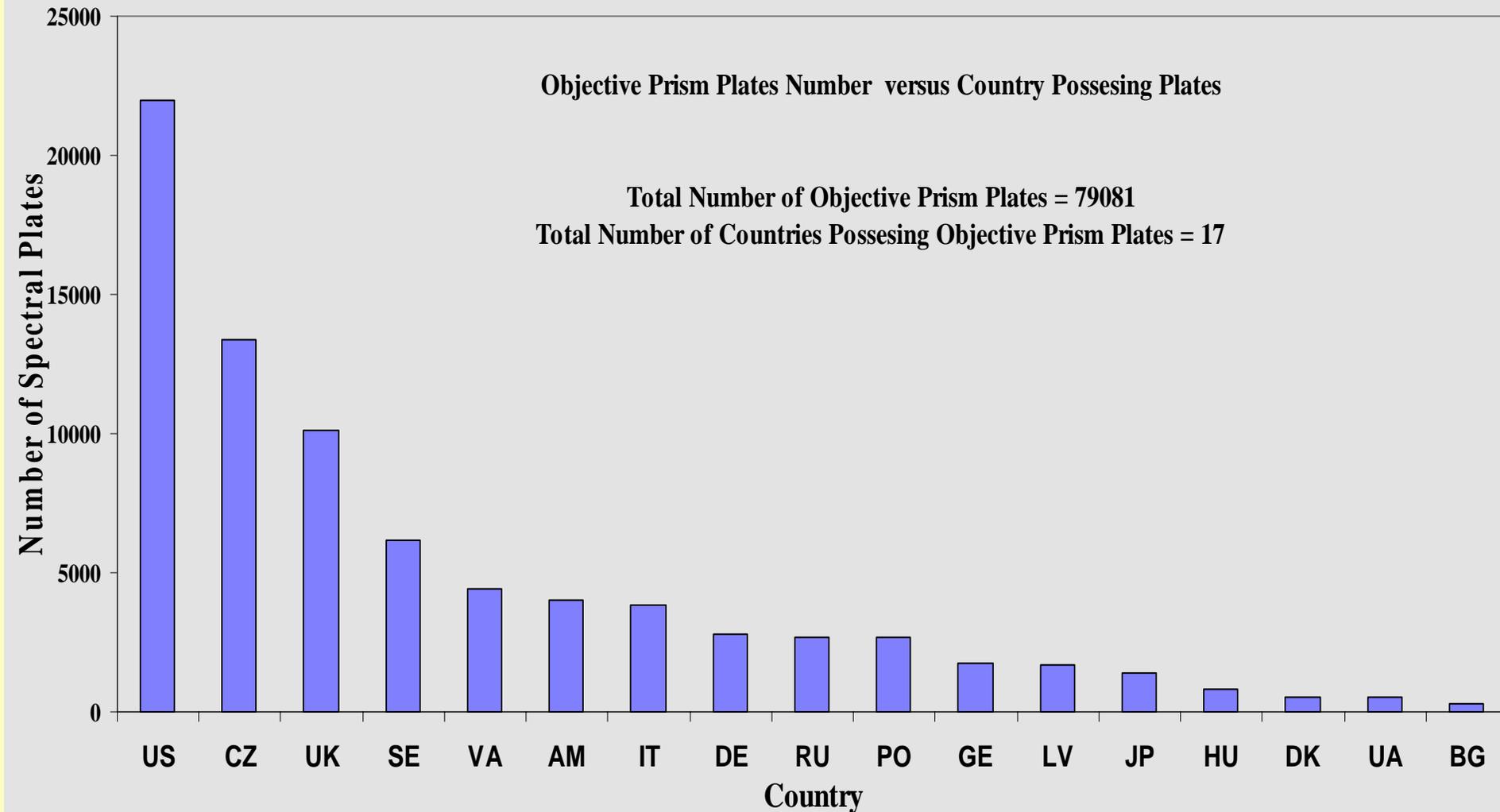


Plate Archives: Countries Possessing Objective Prism Plates



42 Countries possessing wide-field plate archives ordered according to the plate number

USA

Germany

Russia

Ukraine

Tajikistan

Georgia

Italy

UK

Chile

Czech Republic

Armenia

Netherlands

France

Australia

Belgium

Sweden

Latvia

Hungary

Romania

Serbia

Poland

Finland

Mexico

Japan

Slovakia

Bulgaria

Argentina

China

Algeria

Uzbekistan

Indonesia

Spain

Vatican

Estonia

Canada

South Africa

India

Venezuela

Austria

Switzerland

Denmark

New Zealand

Plate Archives Volume: Direct Plates

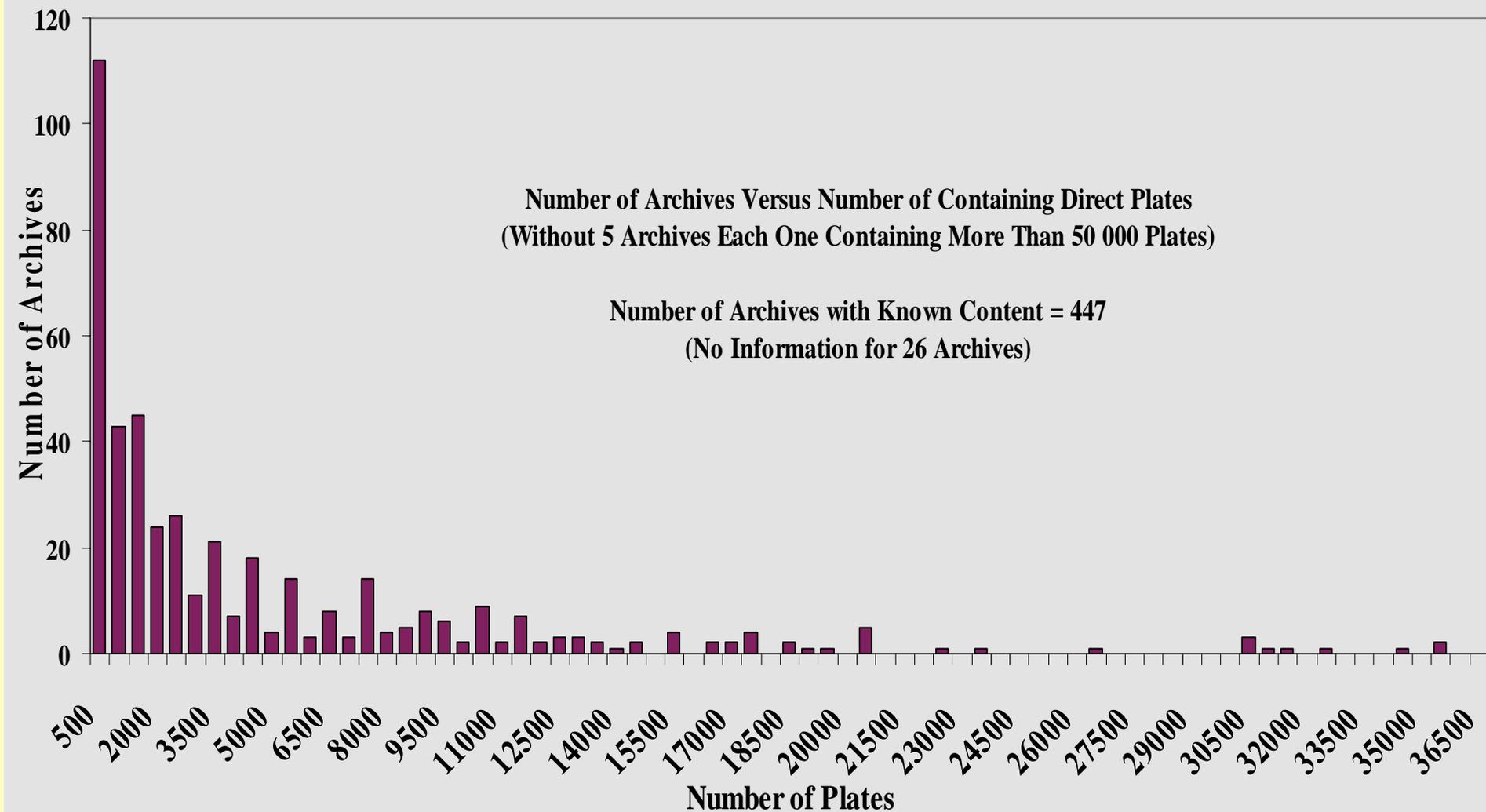
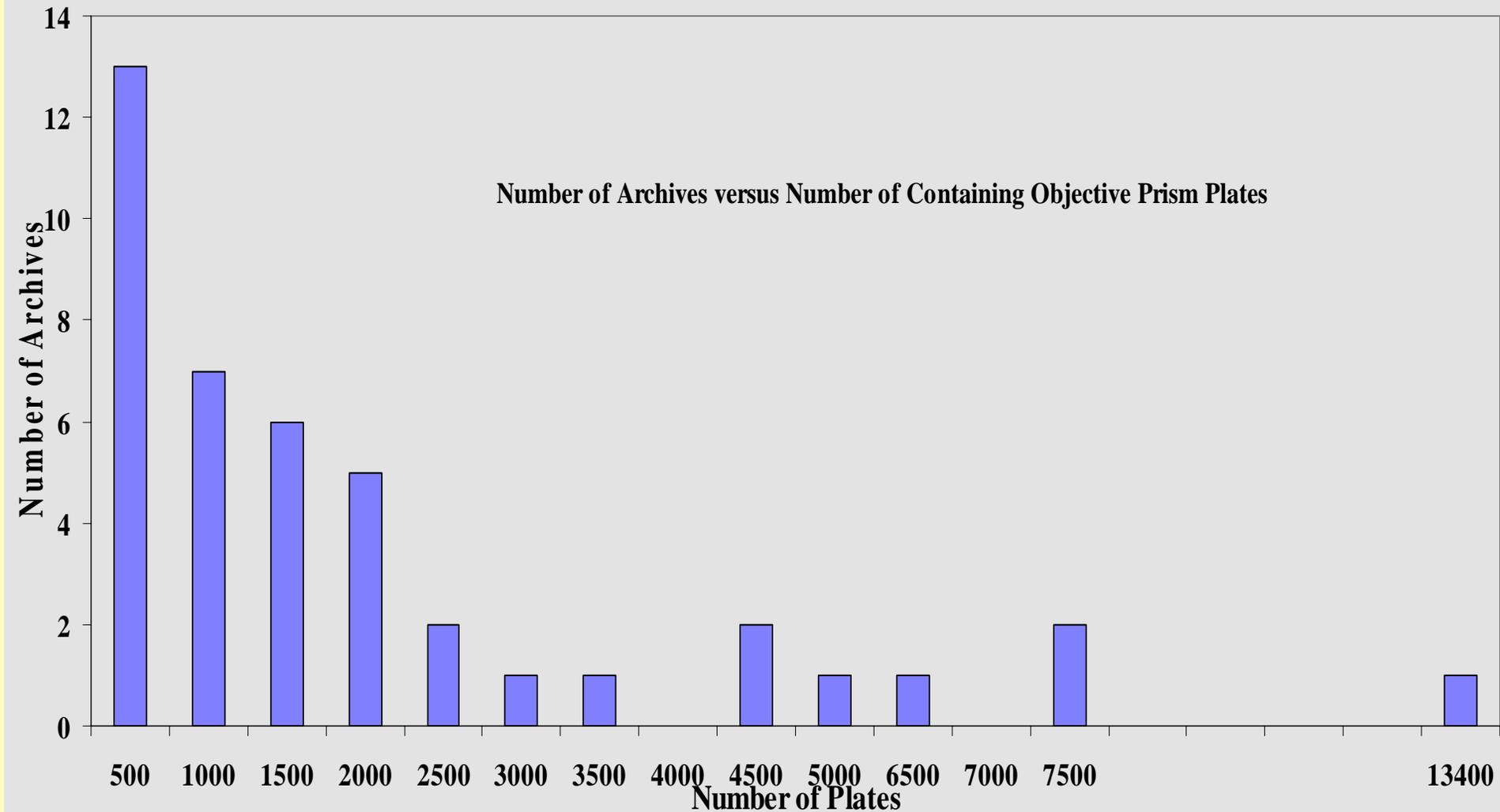
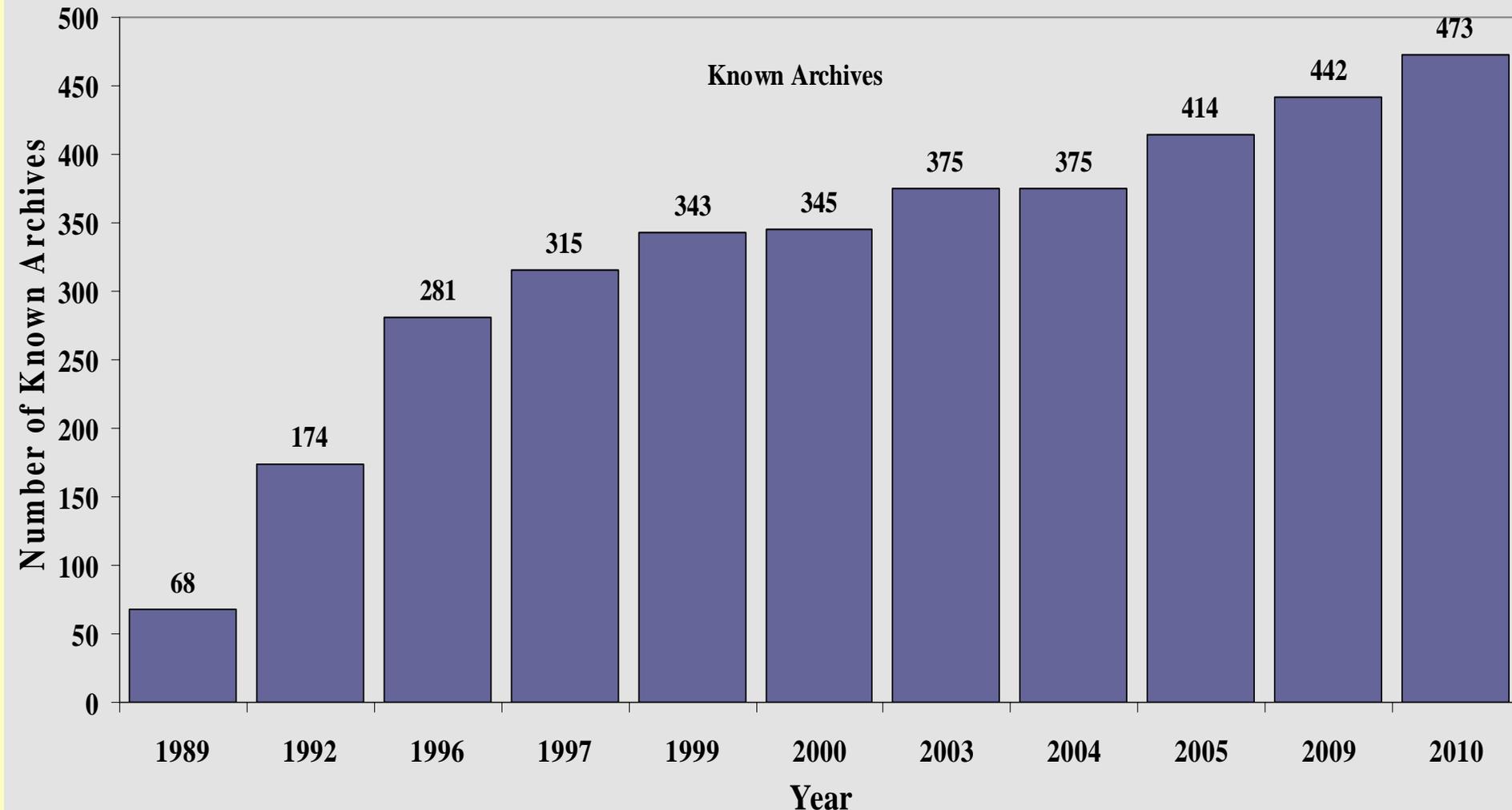


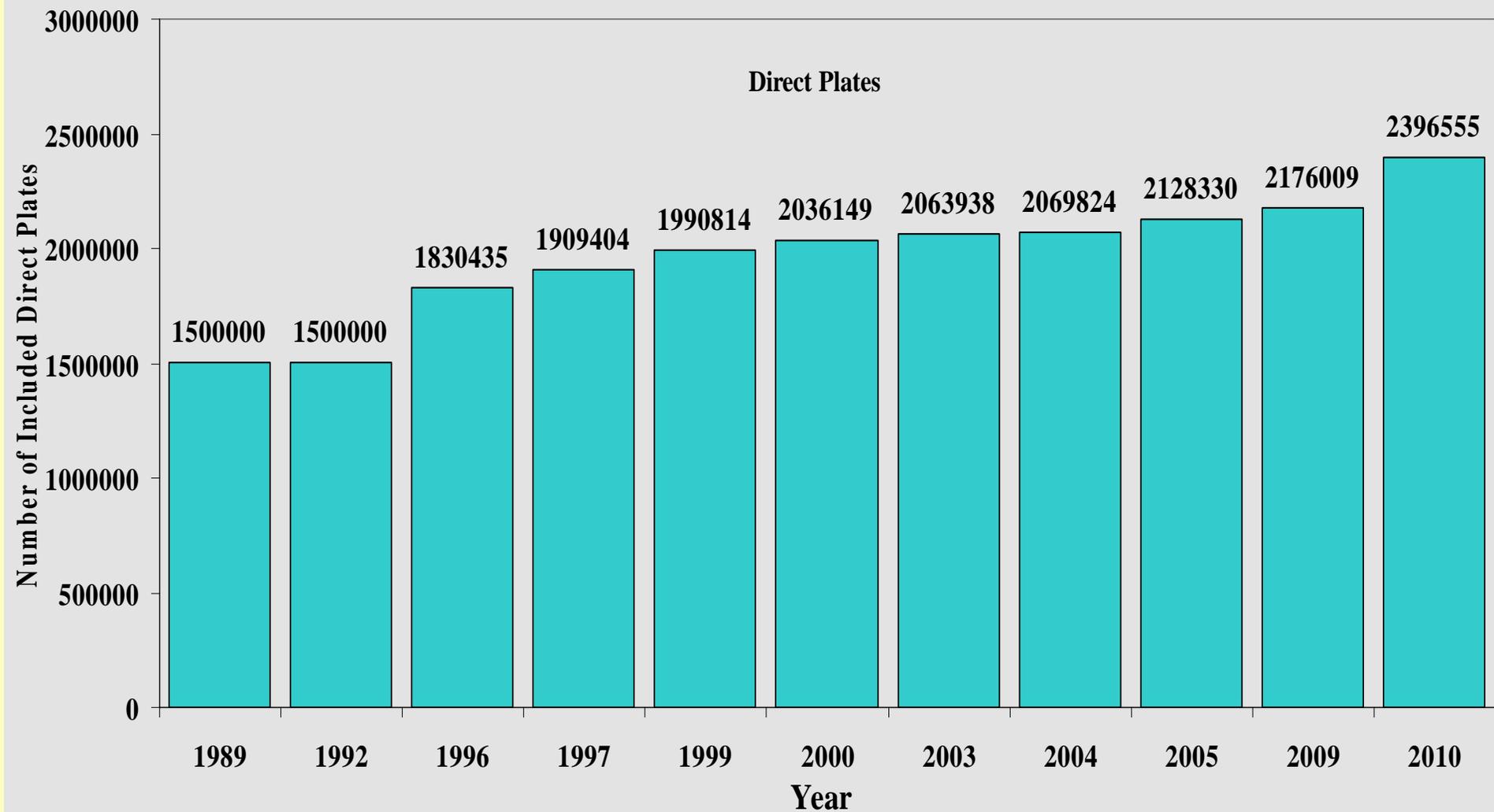
Plate Archives Volume: Objective Prism Plates



Development of the CWFPA: Number of Included Archives



Development of the CWFPA: Number of Included Direct Plates



Development of the CWFPAs: Number of Included Objective Prism Plates



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