

INTERNATIONAL INSTITUTE
FOR
AERIAL SURVEY
AND
EARTH SCIENCES (ITC)
ENSCHEDE, THE NETHERLANDS

A SURVEY OF EDUCATION AND RESEARCH IN PHOTOGRAMMETRY
AND REMOTE SENSING IN THE IRISH REPUBLIC,
THE NETHERLANDS AND THE UNITED KINGDOM

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ISP COMMISSION VI
WORKING GROUP VI-1



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A Survey of Education and Research in Photogrammetry and
Remote Sensing in the Irish Republic, the Netherlands and
the United Kingdom

by

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Abstract

In the context of a world-wide inventory of education in Photogrammetry, Photo-interpretation and Remote Sensing, a survey was conducted for the Irish Republic, the Netherlands and the United Kingdom. The collected and analysed data comprise the educational programmes, instrumentation and staff of the various Institutes in the above mentioned three countries.

Résumé

Dans le contexte de l'inventaire à échelle mondiale de l'enseignement en Photogrammétrie, Photo-interprétation et Télédétection une étude a été effectuée pour la République Irlandaise, les Pays-Bas et le Royaume Uni. Les données rassemblées et analysées, comprennent les programmes d'enseignement, l'instrumentation et la personnel des divers Instituts dans les trois pays surmentionnés.

Zusammenfassung

Als Teil einer weltweiten Uebersicht von den Ausbildungsmöglichkeiten in Photogrammetrie, Photo- nterpretation und Fernerkundung wurden Daten von der Republik Irland, Holland und Grossbritannien gesammelt. Die analysierten Daten umfassen die Ausbildungsprogramme, Instrumente und Mitarbeiter der verschiedenen Institute von diesen drei Ländern.

Acknowledgement

The author would like to express his thanks to all those who contributed to the data collection by answering the questionnaire. A list of the participating Institutes is found in the Appendix (table III).

1. Introduction

At the 13th International Congress of the ISP, Helsinki 1976, it was decided that the activities of the working-group VI-1 should be continued with the inventarisation on a world-wide basis of the educational facilities existing in Photogrammetry, Photo-interpretation and Remote Sensing.

The present survey was conducted based upon a questionnaire which was sent to institutes in Northern Ireland, the Netherlands and the United Kingdom.

When data in the questionnaires were incomplete or missing, other documents were used for completion.

2. Courses at University and Technologist's level

Photogrammetry, Photo-interpretation and Remote Sensing is taught at a great number of Universities and other Institutes of Higher Learning in the three countries. It may form either the main part of the study-programme, a course module, or a part of a course module. The survey as such was not intended to distinguish between these three categories but to ascertain the total number of lecture hours, tutorials and practicals devoted to the theory and application of aerial photography and Remote Sensing techniques to mapping (see Appendix, table I).

The following table illustrates the number of Institutes with activities at University and Technologist's level (see table 1).

Country	Institutes	Graduates/year (approximately)
Irish Republic	2	40
Netherlands	4	690
England	38	2340
Wales	2	120
Scotland	8	470
Northern Ireland	1	70
United Kingdom total	49	3000
Total	55	3730

Table 1: Courses at University and Technologist's level with some components in Photogrammetry, Photo-interpretation and Remote Sensing.

At first sight this number of students graduating annually looks very high.

But one has to consider that most of the courses mentioned comprise of only a very few hours devoted to Photogrammetry, Photo-interpretation and Remote Sensing. Thus only a very few of these graduates can be called specialists.

Table 2 indicates the number of graduates according to the lecture hours involved in the course programmes.

Country	0-20 ^{hrs}	20-50 ^{hrs}	50-100 ^{hrs}	more than 100 hrs or Research
Irish Republic	40	-	-	-
Netherlands	86	-	492*	110
England	2050	183	20	87
Wales	105	-	10	5
Scotland	404	19	30	13
Northern Ireland	70	-	-	-
United Kingdom total	2629	202	60	105
Total	2755	202	552	215

Note: *: specialists in Photo-interpretation and Remote Sensing.

Table 2

Number of graduates at University and Technologist's level according to lecture hours.

Courses with substantial components in Photogrammetry, Photo-interpretation and Remote Sensing exist at the following institutes:

University of Technology, Delft
 Internat. Inst. for Aerial Survey (ITC), Enschede
 Agricultural University, Wageningen (in Photo-interpretation)
 University College, London
 University of Newcastle upon Tyne
 North-East London Polytechnic
 School of Military Survey, Newbury
 University of Glasgow
 University of Wales

When computing the number of qualified professionals per unit area one has still to disregard the many foreign students embarking upon these specialised courses. This results in about 60 to 100 graduates with substantial training in Photogrammetry for the United Kingdom and about 10 in the Netherlands. Not all of them will work in Photogrammetry alone, but might also work in Land Surveying.

If one takes for each graduate a working period of 35 years one finds the following results for the Netherlands and the United Kingdom:

	1 specialist per	
	km ²	inhabitants
Netherlands	110 km ²	38.000
United Kingdom	80 km ²	18.000

Table 3

It should be noted that the table does not include Photo-interpretation specialists and disregards the fact that only a part of these graduates is working in Photogrammetry.

3. Courses at Technician's level

Only a very few Institutes are running regular Diploma-courses for Aerial-survey Technician's. Most of the Technician's training is done "in-house" at the various mapping organisations.

Photogrammetric Technician's Diploma courses are found at the ITC, Enschede and the School of Military Survey at Newbury.

The number of graduates of the two courses together can be estimated to be about sixty per year, half of which is comprised of students from outside Europe.

If the number of Technicians is compared with that of the graduates at University and Technologist's level, the ratio appears to be out of proportion.

4. Teaching staff, Instruments, Curricula and Research

Most of the teaching staff falls either under Civil Engineering or Geography Departments.

Departments of Surveying, Photogrammetry or Topographic Service exist only at those Universities and Colleges where the specialised courses in aerial surveys are given.

As far as instruments are concerned only two institutes (both in the Netherlands) mentioned an analytic plotter. Few departments reported having photogrammetric instruments with automatic coordinate registration devices. A highly significant percentage of the instruments is of the anaglyph type. Those instruments play an important role in training. A significant part of the analogue instruments is rather old and a large number of the instruments are of types which are no longer produced.

As far as tendencies in the contents of the courses are concerned, one sees that increased attention is being given to non-topographic applications and the application of Remote Sensing techniques. Furthermore, emphasis is being placed in digital data-processing.

Research topics were mentioned in some of the questionnaires. Most of the answers concentrated on the applications of Photogrammetry to Engineering and other non-topographic problems; some institutes mentioned projects in Remote Sensing.

5. Conclusions

In 1968 it was estimated* on a world-wide basis that there was one Photogrammetrist (Technicians included!) per 900 km². For the Netherlands and the United Kingdom these figures are in the neighbourhood of one qualified specialist per 100 km². These figures are based on the assumption

* see Reference (3)

of a constant number of graduates per year.

However, one should not overlook the fact that only a part of the graduates is working in Photogrammetry which makes the figure more likely to be about 1 per 200 to 300 km².

At present there is no specialised Training in Photogrammetry and Remote Sensing in the Irish Republic.

A very small number of graduates at technician level is being trained at present compared with that of University level which leads one to the conclusion that there must be an increase in the number of trained technicians with a recognized diploma.

References

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Table I
Education

Degrees/Diplomas/Certificates
with component courses in Photogrammetry and Remote Sensing

England	Degree/Diploma/Certificate				Duration of study (years)	Photogrammetry and Remote Sensing		Students per year	Remarks	Source of data
	BA/BSc CE	BA/BSc Geogr.	HND C.E.	Others		lectures (hrs)	Tutorials/Practicals (hrs)			
Universities	Aston in Birmingham			MPhil/PhD	2-4	n.a.	n.a.	3	Full time Research	Q
	"	x				60		20		Q
	Birmingham	x				8	3	45		3
	"		x			8	16	50		3
	"		x			40	60	2	optional	3
	Bradford	x				8	6	70		3
	Bristol		x			5	15	60		3
	"		x			12	29	8	optional	3
	Cambridge	x			3	4	8	150		Q/3
	"		x			3	8	85		3
	"		x			16	44	7	optional	3
	City University, London	x			5	10	8	60		Q
	Durham		x				no data			6
	Hull		x			6	15	72		3
	Keele		x			3/4	36	25	Remote Sensing	Q
	Leeds	x				11	22	50		3
	"			MSc.Eng.		15	30	6		3
	"		x			11	30	10		3
	Leicester		x			10	10	33		3
London, King's College		x			4	8	30		3	
Imperial College	x				11	4	60		3	
"			BSc/MSc mining		6	3	35		3	

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England (continuation)		Degree/Diploma/Certificate				Duration of study (years)	Photogrammetry and Remote Sensing		Students per year	Remarks	Source of data
		BA/BSc CE	BA/BSc Geogr.	HND C.E.	Others		lectures (hrs)	Tutorials/Practicals (hrs)			
Universities	London, Queen Mary College	x					10	4	35		3
	"		x				10	10	35		3
	University College	x					3	3	32		3
	"	x					24	94	4	optional	3
	"		x				4	8	55		3
	"		x				35	26	4	optional	3
	"				MSc Post-Grad. course in Land Surv.	1	300	420 + project	8	PhD possible	Q
	"						20	60			3
	Manchester	x					14	21	62		3
	"	x					10	-	75	optional	3
	Newcastle upon Tyne	x					6	-	50		3
	"				Dipl. in Highway Eng		10	30	18		3
	"		x				15	9	15		3
	"		x				10	20	6	optional	3
	"				BSc Surv.	3	90	140	8	MSc, PhD possible	Q
	Nottingham	x					5	8	48		3
"	x					16	8	11	optional	3	
Oxford				BSc Eng. Science		8	16	1	optional	Q/3	
"		x				8	16	20	optional	Q/3	
Reading				BSc Est.Man.		4	12	12		3	

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England (continuation)		Degree/Diploma/Certificate				Duration of study (years)	Photogrammetry and Remote Sensing		Students per year	Remarks	Source of data
		BA/BSc CE	BA/BSc Geogr.	HND C.E.	Others		lectures (hrs)	Tutorials/Practicals (hrs)			
Universities	Salford	x				4	?	30 (?)		Q	
	"				MSc High-way Eng.	30		0	not given this year	Q	
	Sheffield	x				3	17	?	80	Q	
	"	x				3	22	?	5	optional	
	"				MA Land-scape Arch.	12			20	Q	
	Southampton		x			3		6	65	3	
	Surrey, Guildford	x				10		40	50	3	
	"				MSc High-way Eng.	10		5	10	3	
	Sussex, Brighton	x				2		12	25	3	
"				MSc Highway Eng.	15		21	4	3		
York				Dipl. in Housing & Revitalisation			no data				
Techn. Colleges	Bolton Inst. of Technology				Degree in Civ.Eng. (CNAA)	4		no data	30	Q	
	"			x		3		no data	20	Q	
	"				HND Building	3		no data	20	Q	
	Bristol Polytechnic				BSc Val.& Est.Man.			10 (?)	40	Q	
	"				HNC Land Surveying			20 (?)	10	Q	

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		BA/BSc CE	BA/BSc Geogr.	HND C.E.	Others		lectures (hrs)	Tutorials/Practicals (hrs)			
Technical Colleges	Ewell Tech.College, Surrey				HNC Eng.		8	3	40		3
	"				HND Build.		8	6	16		3
	Hatfield Polytechnic	x					appr. 10		60		Q
	"			x			appr. 10		30		Q
	Kingston Polytechnic, Surrey		x				no data		12		Q
	Lanchester Polytechnic, Coventry	x					appr. 4		40 (?)	optional	Q
	Polytechnic of Central London	x					33	6	60		Q
	"	x					72	24	3	optional	Q
	North East London Polytechnic				BSc Surv.	3	120 to 180 (?)		40		Q
	"				Diploma Land Surv.	2½	no data		32		Q
	"				HNC Photogr	2 (part-time)	no data		2		Q
	"	x					6		6		3
	"			x			6	6	20		3
	Portsmouth Polytechnic				BSc (Science)	3	90	150	15	incl. Remote Sensing	Q
	"		x			3	30	30	50		Q
	Sheffield Techn. College	x					10	20	23		3
"			x			4	8	30		3	
Royal Military College, Shrivenham	x					7	30	20		Q	
Sunderland Techn. College	x					6	9	25		3	

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England (continuation)		Degree/Diploma/Certificate				Duration of study (years)	Photogrammetry and Remote Sensing		Students per year	Remarks	Source of data
		BA/BSc CE	BA/BSc Geogr.	HND C.E.	Others		lectures (hrs)	Tutorials/Practicals (hrs)			
Technical Colleges	Wigan Technical College	x					20	10	40		3
	"			x			12	9	30		3
	Willesden Tech. Coll. London				HND Build.		12	3	24		3
	"				Dip.Est. Man.		9	3	20		3
	Kingston College of Further Education				HNC Phot (?) HNC Cart (?)			no data no data			6 6
	Oxford College of Technology				Cert. in Cartogr.	1		some			3
	School of Military Survey, Newbury				Post Grad. Pr.Air.		97	160	28		3
	"				Surv.Tech.			500	6-10		3
	"				Int.Air. Surv.Tech.			300	6-10		3
"				Adv.Air Surv.Tech.			700	6-10		3	
Wales											
Universities	Aberystwyth		x				12		100		Q
	"		x				84		10	optional (?)	Q
	"				BSc Env.Sc.		15		15		Q
	Swansea		x		Post Grad. dipl. Cart.	1	}	60-120 (?)	5 (?)		Q
"											

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Education

Degrees/Diplomas/Certificates

with component courses in Photogrammetry and Remote Sensing

Scotland		Degree/Diploma/Certificate				Duration of study (years)	Photogrammetry and Remote Sensing		Students per year	Remarks	Source of data
		BA/BSc CE	BA/BSc Geogr.	HND C.E.	Others		lectures (hrs)	Tutorials/Practicals (hrs)			
Universities	Aberdeen		x				10	20	80		3
	"				MSc Ecology		3	9	7		3
	"				MSc Reg. Res.		10	20	16		3
	Dundee	x					5	-	30		3
	Edinburgh	x					12	18	no data		3
	"		x			4		92	30		Q
	"				MA Geogr.			54	6		Q
	Glasgow	x					9	12	45		3
	"		x			4	120	200	6		Q
	"				Post Grad. diploma	1	220	200	3		Q
	"				M.Appl.Sc.	2	220	200	4	PhD possible	Q
	St. Andrews				MA Geogr.		5	25	20		3
	Stirling				BSc Earth & Env. Sc.		36	40	13		Q
Strathclyde	x					3		80		3	
"				MSc Highway		10	2	6		3	
Techn. Coll.	Paisley College of Technology	x				4	10		50		Q
	"				Degree Land Econ. (RICS students)	4	6		50		Q
	"						3		20		Q

Table I
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Degrees/Diplomas/Certificates
with component courses in Photogrammetry and Remote Sensing

		Degree/Diploma/Certificate				Duration of study (years)	Photogrammetry and Remote Sensing		Students per year	Remarks	Source of data
		BA/BSc CE	BA/BSc Geogr.	HND C.E.	Others		lectures (hrs)	Tutorials/Practicals (hrs)			
Northern Ireland											
Univer- sities	Queen's Univ., Belfast		x				some		no data		Q
	"	x				10	10	70		3	
Irish Republic											
Uni- ver.	University College Dublin	x			4	15	-	30			Q
Tech. Coll.	College of Technology, Dublin				2/3	no data		8			Q
Netherlands											
Universities	University of Technology, Delft			Ir. Geod. Sc.	5	120	80	10			Q
	Intern. Inst. for Aerial Survey and Earth Sciences (ITC) Enschede	MSc Photogrammetry			1½ *	200 + thesis		6-8			Q
		Post Grad. Dipl. Photogr.			1	380	600	30			Q
		Technologist " "			1	370	600	40		incl. students of Dutch mapping organisations	Q
		MSc Cartography			1½ *	some		2			Q
		Post Grad. Dipl. Carto.			1	some		15			Q
Technologist " "			1	some		10		Q			

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Degrees/Diplomas/Certificates
with component courses in Photogrammetry and Remote Sensing

Netherlands (continuation)	Degree/Diploma/Certificate	Duration of study (years)	Photogrammetry and Remote Sensing		Students per year	Remarks	Source of data	
			lectures (hrs)	Tutorials/Practicals (hrs)				
Universities, Technical Colleges	Intern. Inst. for Aerial Survey and Earth Sciences (ITC) Enschede	Post Grad. Dipl. Aer. Photography	1.	260	540	20		Q
		Technologist " " "	1	260	540			Q
		Dipl. Data Proc. in Phot.	½	appr.50	800	1-2		Q
		Technician's Dipl. Photogr.	1	220	600	30	incl. students of Dutch mapping organisations	Q
		Technician's Dipl. Carto.	1	some		15		Q
		Post Grad. Dipl. Geology	1	24***	40**	30		Q
		MSc Geology	1½ *		***	2		Q
		Post Grad. Dipl. Geomorph.	1	24***	40**	15		Q
		MSc Geomorphology	1½*		***	2		Q
		Post Grad. Dipl. Soil Surv.	1	32***	40**	20		Q
		MSc Soil Survey	1½ *		***	4		Q
		Technologist Dipl. Forestry	1	32***	80**	5		Q
		Post Grad. Dipl. Forestry	1	32***	80**	30		Q
		MSc Forestry	1½ *		***	3		Q
		Post Grad. Dipl. Rural Surv.	1	24***	40**	15		Q
MSc Rural Survey	1½ *		***	1		Q		
Post Grad. course Remote Sensing	2 months	20		***	15		Q	

Education/Research

Table II

Equipment for Photogrammetry and Remote Sensing

England		Dept.	Analyt. Instr. Analogue Instr. (excl. Ana- glyph Instr.)	Anaglyph Instr.	Compa- rators	Approx. Instr.	Recti- fiers	Cameras		R.S. Equip- ment	small instr.	source of data
								aerial	terr.			
Universities	Aston in Birmingham	C.E.	2						2		yes	Q
	Birmingham	C.E.							2		yes	3
	"	Geogr.				1					yes	3
	Bradford	C.E.	1								yes	3
	Bristol	C.E.	1 (?)			1 (?)			1 (?)		?	3
	"	Geogr.		1				1	1		yes	6
	Cambridge	C.E.	1	1	2					?	yes	Q
	"	Geogr.	1	1	1			1			yes	3
	City University, London	C.E.	1	1	1				1	no	yes	Q
	Durham	Geogr.	1	1							yes	3
	Hull	Geogr.	1								yes	3
	Keele	Geogr.								yes	yes	Q
	Leeds	C.E.		1							yes	3
	"	Geogr.	1	4							?	6
	Leicester	Geogr.									yes	3
	Liverpool	Geogr.									yes	3
	London, Imperial College	mining							1		yes	3
	Kings College	Geogr.									yes	3
	University College	Geogr.									yes	3
	"	phot.& surv.		9		3	1	1		5	yes	Q
Loughborough	C.E.								1	yes	3, Q	
Manchester	C.E.	1	2		2 (?)				2	yes	3/6	

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Education/Research

Table II

Equipment for Photogrammetry and Remote Sensing

(continuation)

England		Dept.	Analyt. Instr. Analogue Instr. (excl. Ana- glyph Instr.)	Anaglyph Instr.	Compa- rators	Approx. Instr.	Recti- fiers	Cameras		R.S. Equip- ment	small instr.	source of data
								aerial	terr.			
Universities	Newcastle upon Tyne	Surv.	3	2	1	1	1		1	no	yes	Q
	Nottingham	C.E.	1	1		1					yes	3
	Oxford	surv.& geod.		1				2			yes	3/Q
	Reading	C.E.									yes	3
	Salford	C.E.		1					1		yes	3/Q
	Sheffield	C.E.	1		2	1			2	access to equipment	yes	Q
	Southampton	Geogr.									yes	3
	Surrey, Guildford	C.E.	1	1							yes	3
	Sussex, Brighton	Geogr.									yes	3
	York	Arch.	1							1	yes	6
Technical Colleges	Bolton Inst. of Technology	C.E.		1					1		yes	Q
	Brighton Techn. College	C.E.		1							yes	Q/3*
	Bristol Polytechnic	Surv.		1							yes	Q
	Ewell Techn. College, Surrey	Build.E.									yes	3
	Hatfield Polytechnic	C.E.	1	1							yes	Q
	Kingston Polytechnic, Surrey	Geogr.	1								yes	Q
	Lanchester Polytechn. Coventry	C.E.		1	1			1	1		yes	Q
	Polytechnic of Central London	CE Unit	1	1	1	1			1		?	Q
	North East London Polytechnic	Land Surv.	7	7	3	2	1	1		hired	yes	Q
	Portsmouth Polytechnic	Geogr.	2	1		1					yes	Q
"	C.E.									yes	Q	

*) note: according to the questionnaire, no facilities exist for photogrammetry.

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Education, Research

Table II

Equipment for Photogrammetry and Remote Sensing
(continuation)

England		Dept.	Analyt. Instr. Analogue Instr. (excl. Anaglyph Instr.)	Anaglyph Instr.	Compa-rators	Approx. Instr.	Recti-fiers	Cameras		R.S. Equip-ment	small instr.	source of data
								aerial	terr.			
Technical colleges	Sheffield Technical College	C.E.									yes	3
	Royal Military College, Shrivenham	C.E.	2	1					1		yes	0
	Sunderland Techn. College	C.E.									yes	3
	Wigan Technical College	C.E.									yes	3
	Willesden Techn. Coll., London	Build.E.									yes	3
Others	Kingston College of Further Education	Gen. studies				no data						6
	Oxford College of Technology	?				no data						3
	School of Military Survey, Newbury	Air Survey	4	18	2	2	1	2			yes	3
Survey organisations	BKS Survey Ltd.					no data						-
	Directorate of Overseas Surveys					no data						-
	Clyde Surveys Ltd.					Equipment normally used for production, but available for experimental work.				yes	yes	0
	Hunting Survey Ltd.					no data						-
	Ordnance Survey					no data						-
Wales												
Univer-sities	Aberystwyth	Geogr.	2	2							yes	0
	Swansea	Geogr.	5	1		2	2			yes	yes	0

Education/Research

Table II

Equipment for Photogrammetry and Remote Sensing

Scotland		Dept.	Analyt. Instr. Analogue Instr. (excl. Ana- glyph Instr.)	Anaglyph Instr.	Compa- rators	Approx. Instr.	Recti- fiers	Cameras		R.S. Equip- ment	small instr.	source of data
								aerial	terr.			
Universities	Aberdeen	Geogr.	1 (?)					1 (?)			yes	6
	Dundee	C.E.									yes	3
	Edinburgh	Geogr.	4 (?)				1			yes	yes	Q
	Glasgow	Geogr.	5	5	2	1	1	2		yes	yes	Q
	St. Andrews	Geogr.									yes	3
	Stirling	Earth & Env. Sc.									yes	Q
	Strathclyde, Glasgow	C.E.	1	1							yes	3
Tech. coll.	Paisley College of Technology	C.E.	1	1				1		no	yes	Q
Northern Ireland												
Univer- sities	Queen's University, Belfast	Geogr.	1								yes	Q
	"	C.E.	1								yes	3
Irish Republic												
Univ.	University College Dublin	C.E.		1					1	no	?	Q
Tech. coll.	College of Technology, Dublin	Geo.- Surv.	2	2	1		1			no	yes	Q

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Education/Research

Table II

Equipment for Photogrammetry and Remote Sensing

Netherlands		Dept.	Analyt. Instr. Analogue Instr. (excl. Ana- glyph Instr.)	Anaglyph Instr.	Compa- rators	Approx. Instr.	Recti- fiers	Cameras		R.S. Equip- ment	small instr.	source of data
								aerial	terr.			
Universities, Techn. Colleges	University of Technology, Delft	Geod.	4	-	-	some **	-	-	-	no	yes	Q
	Internat. Inst. for Aerial Survey and Earth Sciences (ITC), Enschede	Phot., A.Ph. & Carto										
	"	Nat.Res. Surveys	27 *	14	2	5 + 24 ***	2	3	1	yes	yes	Q
	"	Urban Surv. & Integr. Surv.										
	Agricultural University, Wageningen	Surv.	2	1			1		1	access to equipm. (regular- ly used)	yes	Q
	"	Soil Sc.	-	-	-	-	-	-	-		yes	Q
	State University Utrecht	Geogr.	1	1	-	2				no	yes	Q

*) incl. instr. for Orthophotography

***) ITC Stereotrainers

Table III
Staff for Education and Research in Photogrammetry and Remote Sensing
(data based upon questionnaire only)

England		Dept.	Professors lecturers	Assistants for teaching	Research staff	Technicians	Aux. pers.	Total
Universities	Aston in Birmingham	C.E.	1		8	2	2	13
	Cambridge	Eng. C.E.	2	-	-	½	part.	2½
	City University, London	(Surv. & Phot.)	4	3	2	1	1	11
	Keele	Geogr.	1	-	1	-	-	2
	London, Univ. College	Phot. & Surv.	6	-	5 *	3	1	15
	Newcastle upon Tyne	Surv.	5		1 *	1	1	8
	Oxford	Surv. & Geod.			no data			
	Salford	C.E.			no data			
	Sheffield	C.E.	1	2 (part-time)	2 *	2	-	7
Technical Colleges	Bolton Inst. of Technology	C.E.	2			1		3
	Bristol Polytechnic	Surv.	1	-	-	1	-	2
	Hatfield Polytechnic	C.E.	3		1	1		5
	Kingston Polytechnic, Surrey	Geogr.	1	-	-	1	-	2
	Lanchester Polytechnic, Coventry	C.E.	1	-	-	1	-	2
	Polytechnic of Central London	CE Unit	2	-	-	1	-	3
	North East London Polytechnic	Land Surv.	5			2	1	8
	Portsmouth Polytechnic	Geogr.	2	1	1	1	-	5
	Royal Military College, Shrivenham	C.E.	1	1	2	1		5
Others	Clyde Survey Ltd.	-			6			6

*) Post-grad. students

Table III

Staff for Education and Research in Photogrammetry and Remote Sensing

(data based upon questionnaire only)

Wales		Dept.	Professors lecturers	Assistants for teaching	Research staff	Technicians	Aux. pers.	Total
Univer- sities	Aberystwyth	Geogr.	1		1	1		3
	Swansea	Geogr.	2	-	-	1	-	3
Scotland								
Univer- sities	Edinburgh	Geogr.	2		1	2	1	6
	Glasgow	Geogr.	6		4 *	5	4	19
	Stirling	Earth & Env. Sc.	5	2	4	2	1	14
Tech. Coll.	Paisley College of Technology	C.E.	2	-	-	1	-	3
Northern Ireland								
Univ.	Queen's Univ., Belfast	Geogr.	2	-	2	3	-	7
Irish Republic								
Univ.	University College Dublin	C.E.	1	-	-	1	1	3
Tech. Coll.	College of Technology, Dublin	Geo-Sur.	3	2		1		6
Netherlands								
Univer- sities	University of Technology, Delft	Geod.	3					3

Table III

Staff for Education and Research in Photogrammetry and Remote Sensing

(data based upon questionnaire only)

Netherlands (continuation)		Dept.	Professors lecturers	Assistants for teaching	Research staff	Technicians	Aux. pers.	Total
Universities, Tech. Colleges	Internat. Inst. for Aerial Survey and Earth Sciences (ITC), Enschede	Phot., A.Ph. & Cart.	36	19	5 ***	19	5	84
	"	Nat.Res. Surveys	32	3		2	6	43
	"	Urban S. & Integ. Surveys	16	1			3	20
	Agricultural University, Wageningen	Min.Expl. Surv.	5 1		1	1	2	8
	"	Soil	1	1		1½		3½
	"	Physics	1 **	1				2
	State University Utrecht	Geogr.	1	1				2

*) Post-Grad. students

**) part-time

***) techn. ass.