

SCOTTISH SCHOOLS SCIENCE

EQUIPMENT RESEARCH

CENTRE

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# Introduction

Teachers reading this will by now have their sights firmly set on the imminent summer vacation, and reminders of events which will follow this pleasant interlude may fall on blind eyes and deaf ears. It is, however, a risk which we must take. Our programme of exhibitions for the autumn term is rapidly filling and although dates have still in some cases to be finalised, there would seem to be little room for further requests before Christmas. If anyone has in mind an apparatus exhibition at which they wish our co-operation, an early application is essential, and will have most chance of being successful if a date in November or December is offered. To date we have a firm engagement for 4th - 5th October in Kirkcudbright, and an exhibition of post-Higher apparatus, probably on September 28th, in Nairn. We have also on dates still to be arranged, three exhibitions in Falkirk on the Integrated Science Course, Physics, Chemistry and Biology respectively, and a biology exhibition in Glasgow. We would remind teachers that although these exhibitions are being arranged by individual local authorities, any teacher in the area may attend, although this invitation should not be considered to constitute a prima facie case for getting time off from normal school duties!

\* \* \* \* \*

This spring we have delved further into the second hand market, believing that teachers would welcome the opportunity to obtain useful components cheaply. It is inevitable that most of this equipment is electronic and therefore of interest only to the physics or engineering teacher. We began by uplifting a van load of electronic scrap from the Atomic Energy Research Establishment at Harwell. Teachers who may be holidaying near there might care to note that this scrap is always available, and that if they are prepared to spend time on it they may extract whatever components they wish from the units being offered. The cost is £2.10s. per cwt, with no upper limit on the amount you may take away. If you go, take wire cutters, screwdrivers and sticking plaster - scratched knuckles are inevitable.

Most of our van load was disposed of at the A.S.E. annual exhibition in Glasgow. Since then we have bought several lots at government auction sales and can offer a wide selection of components at give-away prices. Thus we have stocks of high-stability, close tolerance and high power carbon and wirewound resistors, linear carbon potentiometers, 6 in. loudspeakers, and transistor and valve units. A selection of these items will be taken out to the exhibition mentioned above, and teachers may call at the Centre to examine what is available at any time. Although we expect that most teachers will pay for the equipment through petty cash, we are prepared to invoice to the local authority if the teacher has verified that this arrangement is acceptable to them.

\* \* \* \* \*

In our last Bulletin we mentioned that all the exhibits in the technician's special exhibition at the A.S.E. in Glasgow were from the West of Scotland. In doing so we had overlooked one from Aberdeen Academy for which we now apologise to the technician concerned and to the Principal Teacher of Chemistry who brought the matter to our notice.

## Opinion

We are devoting the major part of this Bulletin to a list of equipment which we consider essential for teaching the new biology syllabus. It should not escape the notice of teachers and others that the two most expensive single items on the list, together accounting for some 20% of the total expenditure, are a greenhouse and a refrigerator. Both items require a source of power, and although it is possible to run both items off paraffin, few teachers will doubt that the most convenient form of supply, requiring least attention, is electricity.

I pontificated at some length in Bulletin 18 on the short sightedness of some local authorities who insisted on an electrical shut down over the weekend, and in some cases every night. For this I was rapped over the knuckles by one local authority, themselves blameless, who maintained that although this might need saying we were not the organisation to say it. The argument appears to run that as employees of the local authorities we should not criticise their policy decisions, our relationship with them being similar to that of the civil servant and the central government. It is a view to which I cannot subscribe. As an organisation set up to advise teachers on the purchase and use of science apparatus our first duty must be to them. If we advise a teacher to buy a greenhouse, we must also advise him that its proper use requires a supply of heat throughout the night, weekend, Christmas holiday or whatever. The same applies to the refrigerator. It may be difficult, even impossible, to secure this provision in existing schools. What is unpardonable is that in some quarters the existence of this problem has not been recognised, and that in others schools are still being planned wherein there is no special provision of separate power supplies to biology laboratories so that although the main school is switched off, aquaria, refrigerators etc. can still function.

## Biology Equipment List

The sections into which this list has been divided are those of the S.C.E.E.B. Biology Syllabus. In the introduction to the syllabus it is stated that "the sequence of presentation of topics should not be regarded as a teaching order." Consequently we have indicated thus (\*) the items which we believe will be required to teach the Common Core Science Course, previously called the Secondary Science Course. Since it is intended that in the first two years the two courses will be compatible it can be assumed that this list includes all the items required to teach the biology of the Common Core Science Course.

P denotes that the equipment should be available in pupil quantity, normally one per two or three pupils.

D denotes demonstration apparatus normally on a scale of one per laboratory.

The principle used in compiling this list has in general been to provide details of one source of the material together with an alternative. This should not be taken to mean that versions by other manufacturers are unacceptable or that those listed are 'best buys'. Prices should be regarded as approximate only, although they are/

are the latest available.

SECTION I

1. Locust Cages (Two, or one per lab)

<u>Supplier</u>	<u>Size</u>	<u>Catalogue No.</u>	<u>Price</u>
Griffin		N41-340	£9. - . -.
Harris		B5026	8.15. -.
Gerrard		NM1030	8. - . -.

2.\* Mouse Rearing Cage (Two per lab)

Griffin		S52-130	2.15. -.
Harris		B5018	1.16. 6.

3.\* Aquaria (Three per lab)

1. Framed

Nicolson	46x30x30 cm	710/1000/01	2. 3. -.
Nicolson	93x30x38 cm	710/1000/04	5. 4. -.
Harris	45x30x30 cm	B4980/45	3.12. 6.
Harris	95x37x37 cm	B4980/95	8. - . -.

2. Plastic

Harris	30x20x20 cm	B4978	-.16. 6.
Gerrard	30x20x20 cm	NM1025	-.16. -.
Gerrard	18x12x12 in	"Habitarium"	2.19. 6.

4.\* Thermostats, Aquarium (D)

Griffin		S51-975	-.12. 6.
Nicolson		710/1006	-.18. -.

5.\* Heaters, Aquarium (D)

Griffin		S51-970/15	-. 8. 6.
Gerrard		NM1010	-. 8. -.

6.\* Air Pumps, Piston Type (D)

Griffin	(single)	S51-940	5. 7. 6.
Gerrard	(single)	NM1570	6.17. 6.
Harris	(double)	B4986	9.10. -.

7.\* Wormery - Rothamsted Pattern (D)

Griffin		N41-225	2. - . -.
Gerrard		NM1005	2.10. -.

8.\* Seed Trays (Two dozen per lab). Obtained locally or:-

Harris		B5158	-. 3. 6.
--------	--	-------	----------

9. Plant Pots (4 doz 4 in; 2 doz 6 in; 1 doz 10 in) Obtained locally or:-

Harris	(porous clay)	B5148/10 cm doz	-. 7. 3.
Harris	(porous clay)	B5148/15 cm doz	1. 5. 6.
Harris	(porous clay)	B5148/20 cm doz	2. 7. 6.
Harris	(polystyrene)	B5150/10 cm doz	-. 5. 9.
Harris	(polystyrene)	B5150/15 cm doz	-.15. 6.
Harris	(polystyrene)	B5150/20 cm doz	2. 2. -.

10. Greenhouse (D) Minimum size 120 sq ft with internal partition to give warm and cold sections. Obtained locally or as a kit:-

Bast/

	Bast	8x16 ft Minibrite Packs 1 and 2	£99.15.	-.
11.	<u>Dividing Partition for Item 10</u> (D)			
	Bast	Pack No. 3	15.	-.
12.	<u>Staging</u> (D) (Four packs needed for 8x16 ft greenhouse)			
	Bast	(aluminium) Pack No. 5a	12.15.	-.
	Bast	(P.V.C.) Pack No. 5b	12.15.	-.
	Bast	(wood) Pack No. 6	12.15.	-.
13.	<u>Greenhouse Heater</u> (D)			
	Bast	(Paraffin Aladdin) Pack No. 25	9.19.	-.
	Elt	Electric Fan, 1kW 1284	9.10.	-.
14.	<u>Watering Cans</u> (D) (One large and one small one required)			
	Local	Haw's Pattern, 2 gallon	3.17.	3
		Haw's Pattern, 2 quart	1.18.	6
15.*	<u>Trowels</u> (P) Obtained locally			-.
16.	<u>Garden Fork</u> (D) Obtained locally			2.
17.	<u>Garden Spade</u> (D) Obtained locally (Neverbend)			2.12.
18.	<u>Secateurs</u> (D) Obtained locally			-.
19.	<u>Pruning Knife</u> (D) Obtained locally			17.
20.*	<u>Soil Auger</u> (D) 2 ft. long			6.
	Harris	B4952	1.13.	-.
	Dutt	F75	2.	2.
21.	<u>Compost</u> , John Innes. Obtained locally			
		Seeding, 1 cwt	1.	4.
		Potting, 1 cwt	1.	5.
22.*	<u>Hand Lenses</u> (P) (x8 or x10)			6.
	Griffin	L52-885/015	-.	8.
	Harris	B4590/08	-.	8.
23.*	<u>Collecting Jars</u> (P) Make from plastic detergent bottles, lunch boxes and other easily obtained plastic ware.			
24.*	<u>Sorting Trays</u> (P) Locally obtained plastic basins, trays, pie dishes, etc. or:-			
	Harris	B4802/30	-.	13.
	Gerrard	NM1440	-.	17.
25.*	<u>Polythene Bags</u> (P) Obtained locally, or:-			
	Dutt	12x15 in P545	per 50	-.
	Woolworths	8x9 in	per 60	10.
26.*	<u>Storage Jars</u> (P)			9.
	Local Confectioners. 6 lb jar approx.			-.
	Harris	2 kg B4834/04	-.	2.
27.	<u>Hot Air Oven</u> (D)			6.
	Harris	B5164	37.16.	-.
	Baird	Model 05	32.	-.

28.*	<u>Mud Scoop</u> (D)			
	Gerrard	AG2375	£2. 5. -.	
	See future SSSERC Bulletin for home made version.			
29.*	<u>Plankton Nets with Stick</u> (Four per lab)			
	Gerrard	AG2265/2350	1.11. 3.	
	Harris	B4878/4866	1. 5. 6.	
	A home made version will be published in a future Bulletin.			
30.*	<u>Sweep Nets with Stick</u> (Four per lab)			
	Gerrard	AG2270/2350	2. 1. 3.	
31.*	<u>Specimen Tubes, Glass</u> (P) 75x25 mm			
	Gerrard	GW497 per gross	2. 1. 6.	
	Dutt	G327 per gross	2. -. -. .	
32.	<u>Soil Thermometer</u> (Four per lab)			
	Gerrard	AG1730 c	1.10. -.	
	Harris	C1932	4.12. 6.	
33.*	<u>Light Meter</u> (D)			
	Harris	P8508	12. -. -. .	
	Nicolson	40/1150	8. 5. -. .	
	See future SSSERC Bulletin for home made version.			
34.*	<u>pH Papers</u> (P)			
	Griffin	S33-920/12 per 15 ft	-.12. 9.	
	Dutt	Soil indicator kit F70A	4.15. -. .	
35.*	<u>Stopclock</u> (D)			
	Gerrard	NM1676	3. 8. -. .	
	Griffin	L15-351	3. 8. -. .	
36.	<u>Dissecting Boards</u> (Four per lab)			
	Nicolson	93/1270	1.15. -. .	
	Gerrard	AG1260	1. 8. -. .	
37.*	<u>Transparent Quadrat Frame</u> (P)			
	Gerrard	12x12 cm NM1300	-. 3. 6.	
	Harris	10x10 cm B4960	-. 3. 6.	

SECTION II

38.*	<u>Microscopes</u> (P) Suitable up to O level.			
	Gallenkamp	Olympus MIC	15. -. -. .	
	Griffin	Junior	17.18. 6.	
39.	<u>Microscopes</u> (P) For H and post-H work.			
	Baird	MBR1E	28. 8. -. .	
	Vickers	M14A	49. 2. -. .	
	See supplements in Bulletins 7 and 14 for microscope summaries.			
40.	<u>Minocular Microscopes</u> (x10) (Two per lab)			
	Prior	Stereomaster	42. -. -. .	
	Griffin	S59-184/010	38. -. -. .	

41./

41. 2x2 in Electron Micrographs of Cell Structure (D)
- 42.\* 2x2 in Micrographs, general, in place of demonstration slides.(D)
- |              |  |  |           |
|--------------|--|--|-----------|
| Harris       |  |  | £-. 4. -. |
| S.W. Optical |  |  | -. 4. -.  |

Note. Specified for the Common Core Science Course are Mammal sperm, Mammal egg, and T/S leaf.

SECTION III

43. Refrigerator (D) With full width freezing compartment.
- |         |           |        |  |           |
|---------|-----------|--------|--|-----------|
| Gerrard | 3.4 cu ft | NM1580 |  | 38. 7. -. |
| Harris  | 3.4 cu ft | B4854  |  | 41.12. 8. |
44. Food Calorimeters (D)
- |         |  |         |  |           |
|---------|--|---------|--|-----------|
| Harris  |  | C609    |  | 12. -. -. |
| Griffin |  | N42-140 |  | 8. 2. 6.  |
45. Disposable Syringes and Needles (P)
- |         |       |          |        |          |
|---------|-------|----------|--------|----------|
| Harris  | 1 ml  | B4784/01 | per 10 | -. 7. -. |
| Harris  | 2 ml  | B4784/02 | per 10 | -. 7. -. |
| Harris  | 5 ml  | B4784/05 | per 10 | -. 7. -. |
| Harris  | 20 ml | B4784/20 | per 10 | -.13. 6. |
| Gerrard | 1 ml  | NM1040   | per 12 | -.17. 6. |
| Gerrard | 2 ml  | NM1040   | per 12 | -. 7. -. |
| Gerrard | 5 ml  | NM1040   | per 12 | -.10. 6. |
| Gerrard | 20 ml | NM1040   | per 12 | -.18. -. |
46. Needles for Item 45
- |         |  |        |        |          |
|---------|--|--------|--------|----------|
| Gerrard |  | NM1041 | per 12 | -. 3. 6. |
| Harris  |  | B4786  | per 10 | -. 3. -. |
47. Water Baths (temperature controlled) (Two per lab)
- |       |            |     |  |           |
|-------|------------|-----|--|-----------|
| Grant | 30x13x9 cm | JB1 |  | 12.10. -. |
| Grant | 41x25x9 cm | JB2 |  | 15.10. -. |
- 48.\* Elodea Bubbler Apparatus (D)
- |        |  |       |  |          |
|--------|--|-------|--|----------|
| Harris |  | B5096 |  | 2. 5. -. |
|--------|--|-------|--|----------|
49. Dewar Flasks (D) (Three per lab)
- |         |        |          |  |          |
|---------|--------|----------|--|----------|
| Harris  | 500 ml | B5092/05 |  | -. 8.11. |
| Griffin | 450 ml | S22-050  |  | -. 8. 6. |
- 50.\* Sectioning Knife (P)
- |                       |  |       |  |          |
|-----------------------|--|-------|--|----------|
| Harris (right handed) |  | B4692 |  | -.15. -. |
| Harris (left handed)  |  | B4694 |  | -.18. 6. |
51. Razor Blade with Holder (P) As alternative to Item 50.
- |        |  |       |        |          |
|--------|--|-------|--------|----------|
| Harris |  | B4708 | per 10 | -. 7. 6. |
|--------|--|-------|--------|----------|
52. Prepared Leaf Sections (P and D) All slides required have been listed in an Appendix, q.v.
- 53.\* Spotting Tiles (P) (12 cavities)
- |         |  |        |  |          |
|---------|--|--------|--|----------|
| Gerrard |  | NM1240 |  | -. 4. 3. |
| Harris  |  | C2017  |  | -. 4. 6. |
54. Glucose 1-Phosphate
- |         |     |       |  |          |
|---------|-----|-------|--|----------|
| Gerrard | 1 g | NM788 |  | 1. 4. -. |
| Harris  | 1 g | 909   |  | 1.10. -. |



55.	<u>Aceto-Orcein</u>				
	Gerrard	100 ml	NM816		-. 9. 6.
	Harris	125 ml	1253/15		-.15. -.
56.	<u>A.T.P.</u> (1 ml ampoules containing 10 mg)				
	Gerrard		NM754	per 10	2.10. -.
	Griffin		103-045/010	" 12	2.16. -.
57.	<u>Amylase</u>				
	G.B.I.	25 g	417C		-. 6. 6.
58.*	<u>Diastase</u>				
	Harris	100 g	837/1		-. 8. -.
	Griffin	100 g	181-60		-. 9. 6.
59.*	<u>Pepsin</u>				
	Harris	100 g	1274		-.11. -.
	Griffin	25 g	261-50		-. 5. 6.
60.*	<u>Lipase</u> (Steapsin)				
	G.B.I.	5 g	649C		-. 4. 6.
61.	<u>Yeast</u> Obtained locally approx. 9d. per oz as fresh brewer's yeast. Also obtainable in chemists as dried yeast, or:-				
	Hopkins	250 g	9050		-. 8. -.
62.	<u>Cyclohexane</u>				
	Harris	500 ml	832		-. 9. -.
	Griffin	500 ml	17950		-. 5. -.

SECTION IV

63.*	<u>Skulls</u> , carnivorous, herbivorous and omnivorous. (D)				
	E. and S.P.		SAM70		14. 5. -.
	Gerrard	cat	S1412		2. 5. -.
		rabbit	S1407		1.15. -.
		pig	S1398		7.12. 6.
Note. Common Core Science Course requires only lower jaw and separate teeth.					
64.	<u>Mousetail Measuring Box</u> (2 per lab)				
	Griffin		N41-850		-.14. 6.
	Gerrard		NM1145		-.19. 6.
65.*	<u>Visking Tubing</u> (P) For diffusion and osmosis, see Bulletin 18.				
	Griffin	100 ft	S75-395/006		1.13. -.
	Harris	1 yd	B5030/14		-. 3. 4.
66.	<u>Gas Burettes</u> (P)				
	Harris		B5074		-.12. 6.
	Gerrard		NM1200		-.16. -.
67.	<u>Gas Microanalysis Tubes</u> (P)				
	Griffin		N42-380		-. 7. -.
	Gerrard		NM1270		-.11. 6.
68.	<u>2-6 Dichlorophenol Indophenol, DCPIP.</u>				
	Gerrard	1 g	NM776		-. 6. 6.
	Griffin	1 g	266-025/010		-. 6. -.

69.	<u>Vitamin C</u>				
	Griffin	25 g	130-050/010		£- 5. -.
	Griffin	50 mg tablets	130-095/010	per 100	- 6. -.
	Gerrard	" " "	NM774	per 100	- 4. -.
70.	<u>Pyrogallol</u>				
	Gerrard	100 g	NM746		-.15. -.
	Griffin	100 g	2900035/010		-.17. 6.
71.*	<u>Bicarbonate Indicator</u>				
	Griffin	500 ml	141-042/020		1. 5. -.
72.	<u>Potometers (D)</u>				
	Harris (Ganong)		B5038		3. 5. -.
	Griffin (Farmer)		S51-620		2.15. -.
	Pupil versions are as satisfactory and are easily made - (see Nuffield Guide III, section 9.32.)				
73.	<u>Atmometers (P)</u>				
	Harris		B5050		-.14. 6.
	Microbalances used for atmometry are simply made (see Nuffield Guide III 9.32) using knitting needles. Nuffield Physics microbalance kits are suitable.				
74.	<u>Disposable Petri Dishes (P)</u>				
	Nicolson		402/0066	per 100	2. - . -.
	Griffin		S53-830/096	per 10	- . 3. 3.
75.	<u>Auxanometer (D)</u>	Recording type.			
	Harris		B5129		15.15. -.
76.	<u>Clinostat (D)</u>				
	Nicolson	Electric	93/1285		10. - . -.
	Harris	Clockwork	B5132		11. 5. -.
	Griffin	Electric	S51-535		10.10. -.
	Griffin	Clockwork	S51-530		9. 5. -.
77.	<u>Bird (Pigeon) Skeleton (D)</u>				
	Gerrard		S1044		9.17. 6.
	Harris		X10B0100		12.10. -.
78.	<u>Rabbit Skeleton (D)</u>				
	Gerrard		S1099		12.10. -.
79.	<u>Frog Skeleton (D)</u>				
	Gerrard		S1015		2. 5. -.
80.	<u>T/S Skin Slide</u>	All slides required have been listed in an Appendix, q.v.			
81.	<u>Sach's Solution</u> ,	set of 8 tubes viz. normal, less P, N, Ca, K, Mg, Fe, S.			
	Harris	(to make 4 l)	1784		-.15. -.
	Griffin	(to make 2 l)	389-10		-.10. 6.
82.*	<u>Congo-Red Vital Stain (D)</u>	(Not all Congo reds are suitable for vital staining.)			
	Griffin	5 g	400-10		-11. -.

83./

83.	<u>Human Blood Smear</u>	All slides required have been listed in an Appendix, q.v.		
84.	<u>Lancets (P)</u>			
	Griffin	S54-620	per 250	£1. 7. 6.
85.	<u>Leishman's Stain</u>			
	G.B.I.	100 ml	251C	-. 8. 6.
86.	<u>Incubator (D)</u>	50-60 egg capacity		
	Curfew	Electric	Model 146	20.15. -.
		Oil	Model 149	23.10. -.
87.*	<u>Ear Model (D)</u>			
	Griffin	S51-132		11. -. -..
	E. and S.P.	SAM87		11. -. -..
88.	<u>Model of Human Brain (D)</u>			
	E. and S.P.	SAM69		11.10. -..
	Griffin	S51-072		11.10. -..
89.	<u>Model of Eye (D)</u>			
	Griffin	S51-116		9.15. -..
	Harris	B5228		10.15. -..
90.*	<u>Choice Chambers (P)</u>	Construct from plastic petri dishes, beakers or perspex, using perforated zinc. See Nuffield Biology Guide IV, section 1.33. fig. G.1.		
91.	<u>Rearing Jars</u>	For Drosophila. (2 doz per lab). Small milk bottles or other similar jars are quite adequate.		
92.	<u>Gibberellic Acid</u>			
	Gerrard	0.1 g	NM751	-.15. -..
	Griffin	1 g	"Gibberellic acid"	2.15. -..
93.	<u>Indol Acetic Acid (IAA)</u>	In lanolin.		
	Gerrard	100 g	NM804	-.10. -..

SECTION V

94.	<u>Drosophila Medium</u>	Ready prepared. will last for several weeks if stored at 2-4°C on receipt.			
	Harris	4x1 in tubes	15B0071	per 12	-. 7. 6.
	Gerrard	100 ml			-. 4. 6.
95.	<u>Small Funnels (P)</u>	Polythene.			
	Harris		C1257	per 10	1. 5. -..
	Xlon		XT160		-.11. 3.
96.	<u>Etherisers, for drosophila</u>	(Four per lab).			
	Harris		B5192		-.12. 6.
	Gerrard		NM1506		-. 7. 6.

SECTION VI

97.*	<u>Large Plastic Funnels</u>	(Four per lab)		
	Xlon	240 mm dia	XT3300	1. 1. -..
	Xlon	12 in dia	XT3200	1.12. -..

98./

98.*	<u>Live Trap</u> (Four per lab)			
	Longworth			£1. 7. 6.
	Bowman	25x9x9 cm	A13	1. 2. 6.
	A design for making this will be published in a future Bulletin.			
99.	<u>Pressure Cooker</u> (D) Large domestic type.			
	Harris		B5170	7.12. 6.
	Gerrard		NM1565	7.15. 6.
100.	<u>Balance</u> (Two per lab)			
	Harris	(1 kg x 10 g)	C59	9. - . -.
		(250 g x 1 g)	"	
	Griffin	(2 kg x 0.1 g)	S13-079	11.18. 6.
101.	<u>Penicillin Discs</u> (P)			
	Oxoid			- . 2. 6.
102.*	<u>Agaroids</u> (Ready to use agar media in sterile packs) (P)			
	Oxoid	MacConkey	AG7	} 1.10. -.
		Plate Count	AG183	
		Mannitol Salt	AG85	
		Sabouraud		
		Maltose	AG41A	
		Malt Extract	AG59	
103.*	<u>Agar Powder</u> (P)			
	Harris	100 g	184	- .16. 6.
	G.B.I.	100 g	406C	- .11. 6.

APPENDIX

The following list of slides have been priced on the basis of one demonstration and 12 pupil slides, and are average values only.

	G.B.I.			33. 8. 6.
	Gerrard (less human chromosome)			33. 9. 3.
1.	Human blood smear (P)			
2.	C/S Onion root tip (mitosis) (P)			
3.	Mouth parts of cockroach (P)			
4.	Mouth parts of Musca (P)			
5.	T/S Mammal trachea (D)			
6.	T/S Mammal kidney (D)			
7.	T/S Leaf (P)			
8.	T/S Dicot stem (P)			
9.	T/S Dicot root (P)			
10.	T/S Woody twig (P)			
11.	L/S Woody twig (P)			
12.	L/S Root tip (meristems) (D)			
13.	L/S Stem apex (meristems) (D)			
14.	L/S Bone (P)			
15.	T/S Cartilage (P)			
16.	Teased muscle (streated) (P)			
17.	T/S Human skin (P)			
18.	T/S Testis (mouse) (P)			
19.	T/S Ovary (mouse) (P)			
20.	Human chromosomes (normal male or female) (D)			

Demonstration slides can be replaced if desired by 2 x 2 in micrographs, Item 42.

## Trade News

The firm of Telecare Ltd. who are agents in Scotland for Labgear equipment have organised a by return service for the repair of schools Labgear equipment. Only if requested will the firm give an estimate; otherwise they proceed with the repair as soon as received.

Plastic Aerocups, of nominal 275 ml capacity, can be obtained from the Edinburgh firm of James F. Kidd at a cost of 11s.10d. per 100, or £4.10s.6d. per 1000.

Handy Angle will give free advice on equipment storage to science advisers planning laboratory layouts, or to schools with storage problems in existing buildings.

The cost of radioactive tablets sold by J.A. Radley and mentioned in Bulletin 16 has gone up to 13s.6d. each, except iron 59, which is now 15s. It would also appear from their latest price list that the provision of iodine 131 has been discontinued.

The nine slides recommended for use in the Secondary Science Course are available as a set from T. Gerrard at £1.12s.6d. or from Philip Harris at £2.5s. per set. It is possible that the contents of this set will require to be modified with the introduction of the new biology course.

New from Griffin and George is the Nuffield science catalogue, listing all their Nuffield items in Biology, Chemistry and Physics. One very welcome feature is an alphabetical index for each section. The firm have also brought out a revised price list to be used with their 66 general catalogue.

A comprehensive catalogue of science apparatus, subdivided into Biology, Chemistry and Physics sections has been issued by Philip Harris. Nuffield items are separately indexed.

Andrew H. Baird are now agents for Beck microscopes and accessories.

W.B. Nicolson has issued a new catalogue of physics, biology and general apparatus. Their Nuffield physics items are collected and detailed in numerical order in one section of the catalogue.

A catalogue of meters, both single and multi-range, has been produced by Harris Electronics. Nuffield ranges are obtainable at prices varying between £2 and £2.17s.6d; bench stands to fit are £1.2s.6d. extra.

A multi-range meter kit by Taylor Instruments is now on the market. All components are supplied, but assembly is done by the pupil. The basic meter movement is 40µA F.S.D. Cost of the kit is £5.10s.

What might seem to be the cheapest yet de-ioniser - although one makes such statements in the certainty of being contradicted - has been produced by Elga Products. Called the Elgacan, it costs £13 with replacement cans costing £1 each, the latter being disposable. Typical capacity is 50 litres per can, although throughout Scotland one may expect up to twice that amount owing to the generally softer water experienced here.

S.S.S.E.R.C., 103 Broughton Street, Edinburgh, 1. Tel 031-556 2184.  
Andrew H. Baird Ltd., 33-39 Lothian Street, Edinburgh, 1.  
Bast Glazing Clips Ltd., Cambridge Road, Comberton, Cambridge.  
E.K. Bowman Ltd., 32 Holmes Road, London. N.W.5.  
Curfew Appliances Ltd., Ottershaw, Chertsey, Surrey.  
P.K. Dutt and Co. Ltd., Clan Works, Howard Road, Bromley, Kent.  
Educational and Scientific Plastics Ltd., Holmethorpe Avenue,  
Holmethorpe, Redhill, Surrey.  
Elga Products Ltd., Lane End, Bucks.  
George H. Elt Ltd., Eltex Works, Worcester.  
G.B.I. (Labs), Heaton Street, Denton, Lancs.  
A. Gallenkamp and Co. Ltd., Technico House, Christopher Street,  
London, E.C.2.  
T. Gerrard and Co. Ltd., Worthing Road, East Preston, Nr. Little-  
hampton, Sussex.  
Grant Instruments Ltd., Barrington, Cambridge.  
Griffin and George Ltd., Braeview Place, Nerston, East Kilbride,  
Glasgow.  
Handy Angle Ltd., Reparco Works, Hamilton, Lanarkshire.  
Philip Harris Ltd., St. Colme Drive, Dalgety Bay, Fife.  
Harris Electronics Ltd., 138 Gray's Inn Road, London, W.C.1.  
James F. Kidd, 33 Jeffrey Street, Edinburgh, 1.  
Labgear Ltd., Cromwell Road, Cambridge.  
Longworth Scientific Instruments Ltd., Abingdon, Berks.  
W.B. Nicolson Ltd., Thornliebank Industrial Estate, Glasgow.  
S.W. Optical Instruments Ltd., Hooper's Pool, Southwick, Nr.  
Trowbridge, Wilts.  
Oxoid Ltd., Southwark Bridge Road. London. S.E.1.  
W.R. Prior and Co. Ltd.. London Road, Bishop's Stortford, Herts.  
J.A. Radley Ltd., 220/222 Elgar Road, Reading, Berks.  
Taylor Electrical Instruments Ltd., Montrose Avenue, Slough, Bucks.  
Telecare Ltd., 66 Osborne Street, Glasgow, C.1.  
Vickers Instruments Ltd., Haxby Road, York.  
Xlon Products Ltd., 323a Kennington Road, London, S.E.11.