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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 46/96

Part I

10 - 12 November 1996

PERSONNEL

B Stewart	(SIC), SSO, DANI.
P Elliott	SO, DANI.
J Bacheller	Res. Assist. QUB
D Wallace	Student, Univ. Ulster

OBJECTIVES

i. To assess temperature, salinity and nutrient distributions over a grid of stations in the north western Irish Sea.

NOTE

In cooperation with representatives of Irish Sea fishermen, it was decided to relocate the mooring close to the position of a known ship wreck in an area of low fishing intensity, approximately 2 miles west of station 45. In order to allow for the organisation of navigation warning broadcasts and notices to mariners to become effective, the redeployment of the mooring was postponed until part II of the cruise, scheduled for 27 - 28 November 1996.

CRUISE NARRATIVE

Sunday 10 November 1996

In preparation for the cruise, all DANI scientific crew were onboard by 2000 hrs when monitoring equipment was tested and confirmed to be functioning properly. Following a talk on ship safety and a demonstration of life saving equipment, the RV Lough Foyle departed Belfast at 2200 hrs and sailed overnight in a light breeze to station 50 (see attached sampling grid).

Monday 11 November 1996

The ship arrived on station 50 at 0745 hrs. The weather was dry and bright with a fresh to strong northerly wind. Work commenced at 0800 hrs when the rosette water sampler was deployed. On completion of sampling, the vessel sailed to stations 45 and 38 and then in an easterly direction towards station 47 in Dundalk Bay. In a strong to gale force northerly wind, work for the day finished on coastal station 36 at 1900 hrs. In heavy seas the vessel sailed to anchor overnight in Dundrum Bay.

Tuesday 12 November 1996

The persistent strong wind delayed the start of work until late morning, when the wind began to ease and the survey was able to continue from station 24 at 1105 hrs. The vessel continued in a mainly northerly direction along a grid of stations 22, 21 and 16 to arrive on station 15 at 1700 hrs. At this stage the wind had increased to gale force and the remaining stations 14, 6 and 4 on the sampling grid, were sampled from the ship's clean seawater supply. The survey completed, the vessel sailed to dock in Belfast at 2230 hrs.

Wednesday 13 November 1996

Work commenced at 0750 hrs when scientific and mooring equipment was prepared for unloading. Work was completed at 1115 hrs when scientific personnel disembarked from the vessel.

PARAMETERS MONITORED

The CTD/rosette water sampler was deployed, weather permitting, at most stations on the sampling grid to acquire nutrient, chlorophyll a, temperature and salinity data from the depth profile. In addition, samples were taken every 10 metres over the depth profile at stations 38, 45 and 50 for the determination of oxygen, carbon and nitrogen. At stations 14, 6 and 4, samples were taken via the ship's clean seawater supply. Daylight permitting, Secchi disc readings were also taken at each station. The Bowers & Connelly mini-corer was successfully deployed only at station 45 where sediment samples were subsampled for C/N and chlorophyll *a* analysis.

SUMMARY OF RESULTS

From the acquired nutrient and CTD profile data, the entire survey area was found to be mixed from surface to bottom. Temperature and salinity of southern open sea (50, 45 & 38), northern open sea (21&16) and county Down coastal stations (22 & 15) was typically 12.4 °C and 34.4 ppt respectively; typical inorganic nitrogen values were similar to the same period last year and ranged 5-6 micromoles N l^{-1}. Freshwater influence was observed at stations 47 and 36 in Dundalk Bay where salinity was typically 34.0 ppt throughout the profile and temperatures were 3 - 4 °C lower than monitored at the open sea stations. Increased nutrient concentrations in this area, typical inorganic nitrogen 8 - 11 micromoles N l^{-1}, gave further evidence of the River Boyne influence in Dundalk Bay.

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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 46/96

Part II

27 - 28 November 1996

PERSONNEL

B Stewart (SIC), SSO, DANI.
P Elliott SO, DANI.
S Bloomfield ASO, DANI.

OBJECTIVES

i. To redeploy instrumentation moorings in the Irish Sea at position 53^0 41.90^{l}N & 05^0 34.60^{l}W.

CRUISE NARRATIVE

Wednesday 27 November 1996

In preparation for the cruise, all DANI staff were on board by 1930 hrs when mooring components were assembled and instrumentation tested and programmed for deployment. Following a talk on ship's safety and a demonstration on the proper use of personal life saving equipment, the RV Lough Foyle departed Belfast at 2230 hrs and sailed overnight in light winds to the mooring site at station 45S.

Thursday 28 November 1996

The ship arrived on station 45S at 0745 hrs. The weather was bright and cold with only light winds. Work commenced at 0800 hrs when final preparations were made for mooring deployment. The mooring with a water sampler and thermistors attached (buoy i.d. No. 2) was eventually deployed at position 53^0 42.16^{l}N 05^0 34.61^{l}W at 0915 hrs. The remaining mooring consisting of a toroid and anchor (buoy i.d. No. 3) was deployed at position 53^0 41.92^{l}N 05^0 34.56^{l}W at 1000 hrs. The vessel then sailed to dock in Belfast at 1640 hrs. The scientific crew disembarked at 1700 hrs and unloading of scientific and mooring equipment was completed the following morning.

Moored McLane water sampler

The redeployed McLane water sampler was programmed to sample every other day at the time of slack tide, from 29 November 1996.

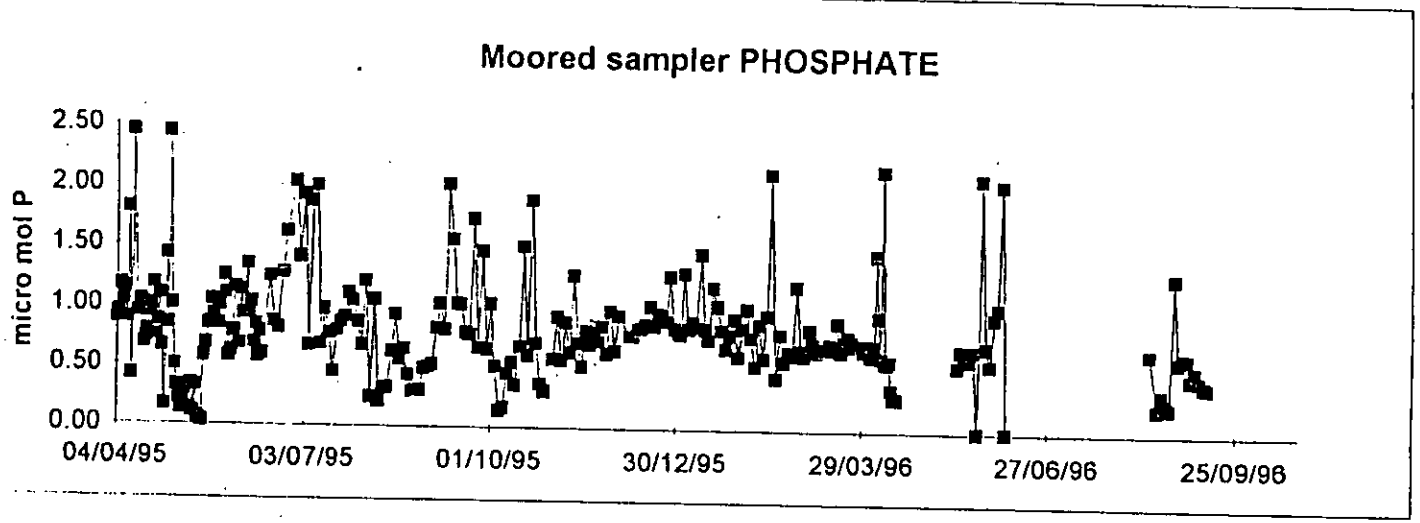
Unfortunately the nutrient data set from the water sampler has been interrupted on two occasions when the mooring was damaged in collisions with passing vessels. Inorganic nitrogen and orthophosphate data from the moored sampler is shown in figure 1.

ACKNOWLEGEMENTS

The ship's master, officers, engineers, catering staff and crew are thanked for their cooperation during this cruise.

B M STEWART

2 December 1996


Moored sampler PHOSPHATE
micro mol P
2.50
2.00
1.50
1.00
0.50
0.00
04/04/95
03/07/95
01/10/95
30/12/95
29/03/96
27/06/96
25/09/96

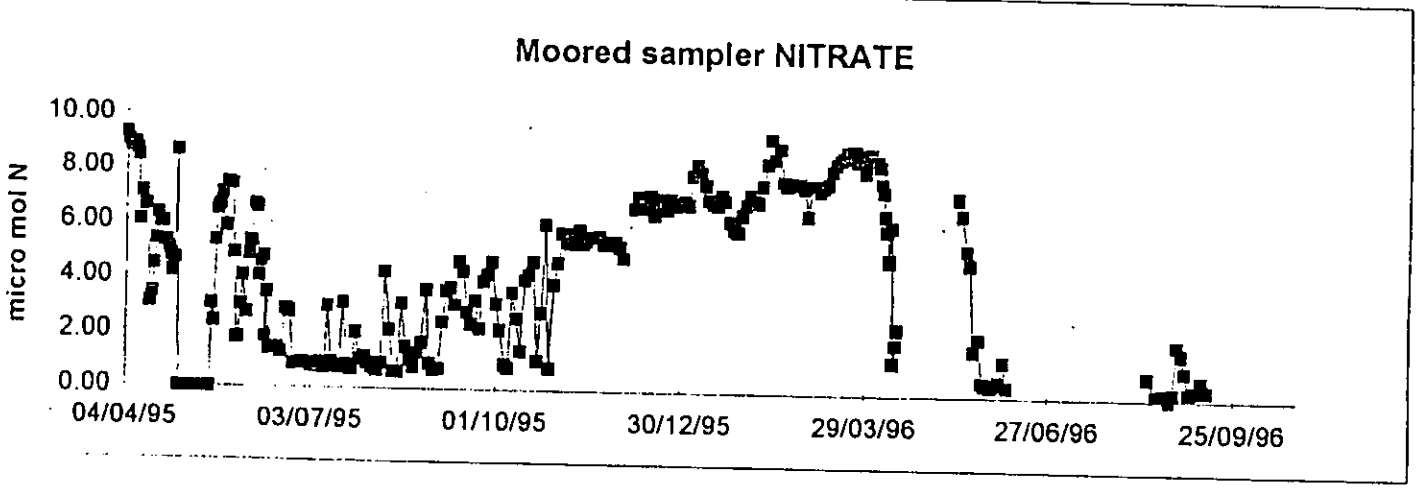

Moored sampler NITRATE
micro mol N
10.00
8.00
6.00
4.00
2.00
0.00
04/04/95
03/07/95
01/10/95
30/12/95
29/03/96
27/06/96
25/09/96

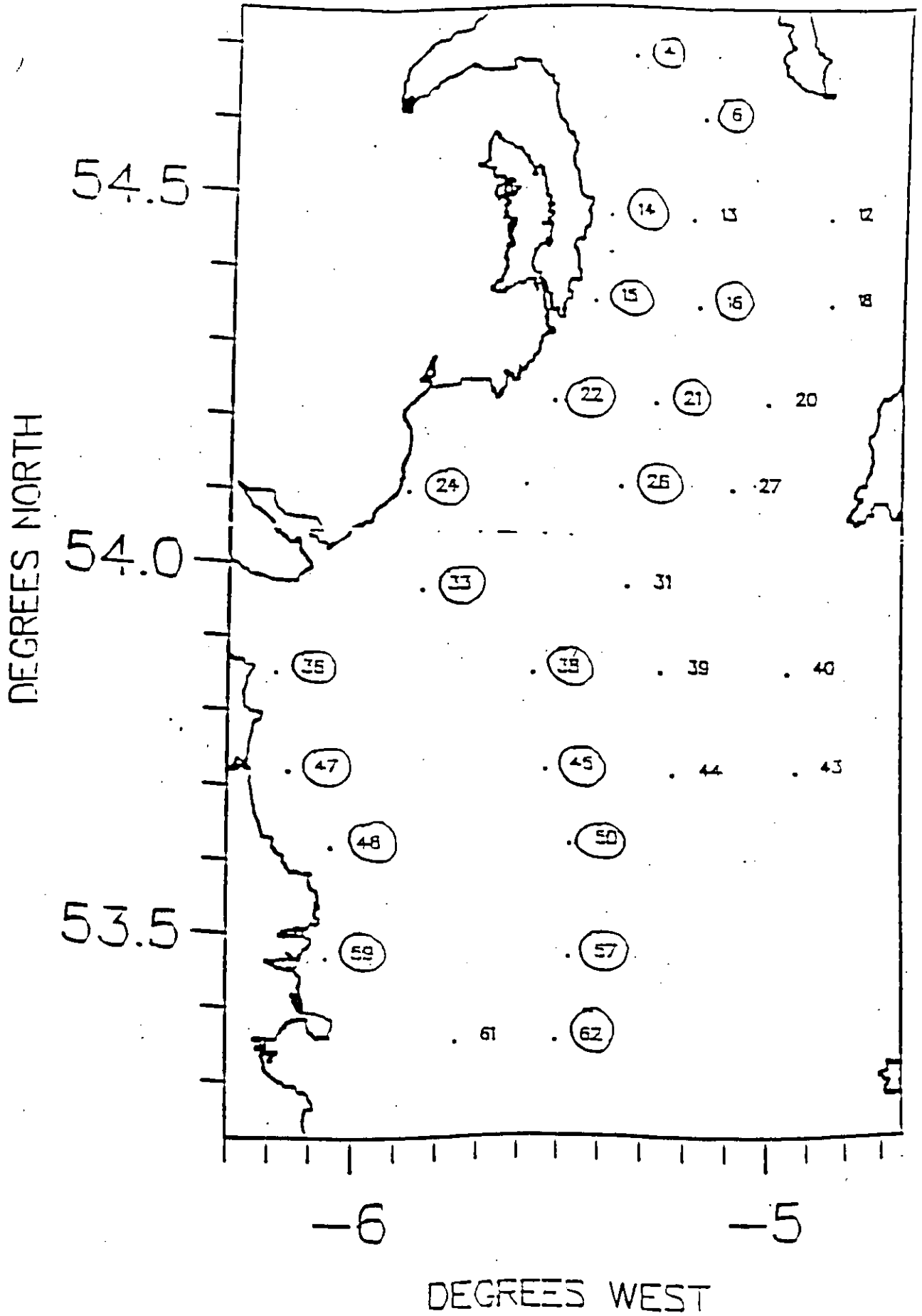
Fig. 1.

IRISH SEA OCEANOGRAPHY 1996

DEPTH PROFILE DATA (11 - 12 NOVEMBER 1996)

	DEPTH M	AMMONIA um N/l	PHOSPHATE um P/l	NITRATE um N/l	SILICA um SiO2/l	UREA um N/l	NITRITE um N/l
STATION 50 11/11/96	1.6	1.14	0.72	5.13	6.10	1.66	0.07
	8.9	1.07	0.73	5.11	5.91	1.71	0.06
	20.1	1.09	0.72	5.09	6.37	1.69	0.07
	30.2	1.00	0.71	5.12	6.51	1.58	0.06
	40.0	0.73	0.14	0.99	4.08	1.48	1.09
	49.7	1.02	0.72	5.07	5.96	1.68	0.08
	61.4	1.08	0.72	5.11	6.05	1.78	0.06
	70.8	0.88	0.76	5.14	6.06	1.70	0.06
	79.6	1.11	0.74	5.10	6.21	1.74	0.07
	89.9	1.16	0.78	5.17	6.36	1.78	0.08
	103.4	1.17	0.77	5.10	6.23	1.81	0.09
STATION 45 11/11/96	2.2	1.47	0.76	5.43	6.04	2.08	0.10
	10.6	1.06	0.75	5.39	6.39	1.73	0.05
	20.9	1.08	0.75	5.43	6.26	1.65	0.05
	30.6	1.32	0.75	5.44	6.21	1.80	0.04
	39.9	1.19	0.76	5.51	6.62	1.65	0.06
	50.0	1.38	0.70	4.17	4.95	1.63	0.07
	59.1	0.90	0.66	4.04	4.90	1.57	0.96
	69.5	0.93	0.76	5.36	6.26	1.75	0.07
	79.6	1.13	0.81	5.47	6.55	1.81	0.08
	89.9	1.18	0.81	5.40	6.24	1.85	0.05
	103.9	1.02	0.77	5.23	6.90	1.75	0.06
STATION 38 11/11/96	2.0	0.82	0.60	3.28	4.63	1.45	0.02
	10.5	0.84	0.71	5.26	6.41	1.62	0.02
	21.1	1.03	0.70	5.27	6.40	1.58	0.03
	31.5	1.10	0.74	5.29	6.33	1.54	0.05
	41.3	1.04	0.68	4.79	5.87	1.56	0.03
	51.3	1.10	0.75	5.54	5.96	1.71	0.05
	60.0	1.04	0.71	5.27	6.20	1.61	0.02
	71.9	1.09	0.73	5.40	6.19	1.60	0.04
	80.3	1.19	0.74	5.38	6.10	1.72	0.07
	90.4	1.03	0.64	4.58	5.36	1.57	0.04
STATION 47 11/11/96	4.4	2.61	0.97	6.50	5.23	2.47	0.45
	12.4	3.00	1.02	9.18	6.68	2.60	0.58
STATION 36 11/11/96	2.9	2.33	0.93	8.69	7.22	2.04	0.56
	9.4	2.82	1.08	11.44	9.54	2.45	0.73
	16.8	2.78	1.07	11.36	9.34	2.34	0.71
STATION 24 12/11/96	2.1	1.09	0.66	6.14	5.37	1.72	0.30
	8.9	1.03	0.68	6.13	5.21	1.87	0.31
	20.0	1.40	0.79	7.42	7.34	1.80	0.36
STATION 22 12/11/96	2.0	1.25	0.85	5.34	6.13	2.45	0.18
	10.1	1.71	0.96	6.33	8.49	2.21	0.13
	20.6	1.51	0.94	6.35	7.31	2.11	0.10
	33.9	1.60	0.85	5.37	6.30	2.30	0.12

STATION 21 12/11/96	2.8	1.20	0.62	4.36	4.46	1.62	0.05
	19.5	0.86	0.58	4.21	4.84	1.53	0.04
	60.2	1.43	0.73	5.73	6.17	1.62	0.04
	100.1	1.15	0.68	4.54	5.14	1.60	0.04
STATION 16 12/11/96	2.5	1.43	0.64	3.90	4.02	1.86	0.12
	17.4	0.93	0.67	4.22	4.45	1.64	0.09
	49.4	1.43	0.83	5.48	5.82	1.81	0.07
	79.4	1.00	0.76	5.27	5.58	1.63	0.05
	138.9	1.53	0.85	5.67	5.90	1.98	0.09
STATION 15 12/11/96	2.0	1.33	0.83	6.17	5.61	1.63	0.13
	12.2	1.45	0.85	6.16	5.44	1.88	0.13
	27.1	2.12	0.73	6.29	4.14	2.02	0.15
STATION 14 12/11/96	4.0	1.51	0.85	6.69	5.27	2.02	0.31
STATION 6 12/11/96	4.0	1.35	0.80	5.49	4.84	1.81	0.09
STATION 4 12/11/96	4.0	1.31	0.70	5.53	4.40	1.68	0.08



SAMPLING SCHEDULE

CRUISE Biological Oceanography LF 46/96

DATE 10-15 November 1996.

BIOLOGICAL OCEANOGRAPHY CRUISE LF 46/96

10 - 15 November 1996

PROPOSED WORK SCHEDULE

STATION	Lat.	Long.	Activity
36	53 51	06 11	CTD, Secchi
47	53 43	06 09	CTD, Secchi, corer + sediment C/N & Chl a.
48	53 37	06 03	CTD, Secchi.
59	53 28	06 03	CTD, Secchi
62	53 21	05 30	CTD, Secchi
57	53 28	05 28	CTD, Secchi
45*	53 43	05 32	CTD, Secchi, corer + sediment C/N & Chl a. (C/N & Oxygen @ 10 m intervals) 24 hour duration process experiment
50	53 37	05 28	CTD, Secchi (C/N & Oxygen @ 10 m intervals)
38*	53 51	05 34	CTD, Secchi (C/N & Oxygen @ 10 m intervals)
4	54 41	05 20	CTD, Secchi
6	54 36	05 10	CTD, Secchi
16	54 21	05 10	CTD, Secchi
21	54 13	05 16	CTD, Secchi.
26	54 06	05 21	CTD, Secchi
33	53 58	05 50	CTD, Secchi
24	54 06	05 52	CTD, Secchi
22	54 13	05 31	CTD, Secchi
15	54 21	05 25	CTD, Secchi
14	54 28	05 23	CTD, Secchi

* Mooring to be deployed at either station 38 or 45