NORSAR

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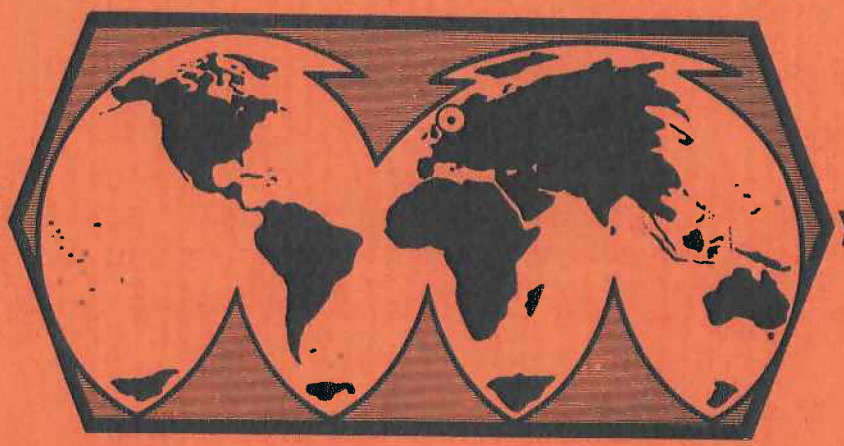

VI.2 A New Refraction Seismic Profile in the North Sea/Southern Norway

The field work of a seismic refraction profiling investigation in the North Sea/southern Norway was carried out in the time period 26 July - 4 August 1980 as a joint undertaking between NORSAR and the Universities of Cambridge and Bergen. Ten shots were fired in Norwegian waters and recorded on land in Norway by a total of 13 field stations. Data for shots arranged by Cambridge and NORSAR are given in Tables VI.2.1 and VI.2.2, respectively.

Recording lines and the location of the NORSAR array as well as shot points are given in Fig. VI.2.1. During shots at N2, N3, N4 and N5, the 13 field stations occupied permanent positions along leg 1 (Fig. VI.2.1). During subsequent shots H1-H6 at the same position, the stations were moved along the profile, covering one leg for each shot. The presence of the Oslo Graben at the far end of the profile motivated recording along two different lines in this area.

As of today, all station locations have been read and shot-to-station distances calculated. Stacking of all data onto digital tapes is under way. Preliminary travel times have been computed on the basis of records from Cambridge stations (prepared by Bruce Cassell) and are shown in Fig. VI.2.2 for both the N and H shot series. Data from shots N2-N5 indicate a dipping Moho in the transition area between the North Sea and southern Norway, while the Pn velocity along the land profile seems to attain 'normal' values of slightly more than 8 km/s. The Pn arrivals within the Oslo Graben tend to be earlier than outside.

Data from the permanent NORSAR array for shot H1 are shown in Fig. VI.2.3, where all traces are arranged according to the distance to the shot point. Two clear P-arrivals are seen in this section, the early one corresponding to Pn, the later one probably being the slower (~6.5 km/s) crustal Pg phase.

S. Mykkeltveit

SHOT	SIZE kg	DATE	TIME BST HRS:MINS:SECS	POSITION LATITUDE	POSITION LONGTITUDE	SHOT DEPTH m	WATER DEPTH m
S1	125	18.7.80	20:02:19.910	56°49'59.219"N	00°54'11.394"E	92	92
F2	1000	19.7.80	17:03:35.905	56°14'33.226"N	02°11'26.792"W	47.5	53
F7	500	21.7.80	16:03:24.364	56°42'28.843"N	00°20'38.848"E	96.5	176
S2	75	26.7.80	13:02:07.043	56°53'52.424"N	01°15'38.683"E	94.6	94.6
S3	75	26.7.80	15:02:08.364	56°57'56.878"N	01°35'46.265"E	100.3	100.3
S4	75	26.7.80	18:02:10.706	57°02'13.893"N	01°56'59.928"E	92.4	92.4
S5	125	26.7.80	20:02:18.188	57°04'39.369"N	02°11'28.942"E	90.0	90.0
N2	500	27.7.80	06:03:12.262	57°21'26.944"N	03°41'43.647"E	58	65.2
N3	500	27.7.80	12:03:11.490	57°29'44.472"N	04°26'12.679"E	73	80.6
N4	500	27.7.80	19:03:12.038	57°38'38.648"N	05°17'40.619"E	83	101.5
N5	750	28.7.80	06:03:16.623	57°35'51.680"N	06°00'40.613"E	102	145

Table VI.2.1. Shots in the North Sea arranged by Cambridge University.

SHOT	SIZE Kg	DATE	TIME GMT Hrs:Mins:Secs	POSITION LATITUDE	POSITION LONGITUDE	SHOT DEPTH (= Water Depth) m
H1	825	31.7.80	06:00:00.37	57°36'24"N	05°58'18"E	140
H2	825	31.7.80	18:00:00.40	57°36'00"N	05°59'30"E	136.5
H3	825	1.8.80	18:00:00.20	57°36'24"N	05°59'06"E	139
H4	825	2.8.80	18:00:00.09	57°36'30"N	06°00'12"E	138
H5	825	3.8.80	18:00:00.06	57°36'12"N	05°59'00"E	142
H6	825	4.8.80	18:00:00.20	57°36'06"N	06°00'06"E	138

Table VI.2.2. Shots in the North Sea arranged by NORSAR.

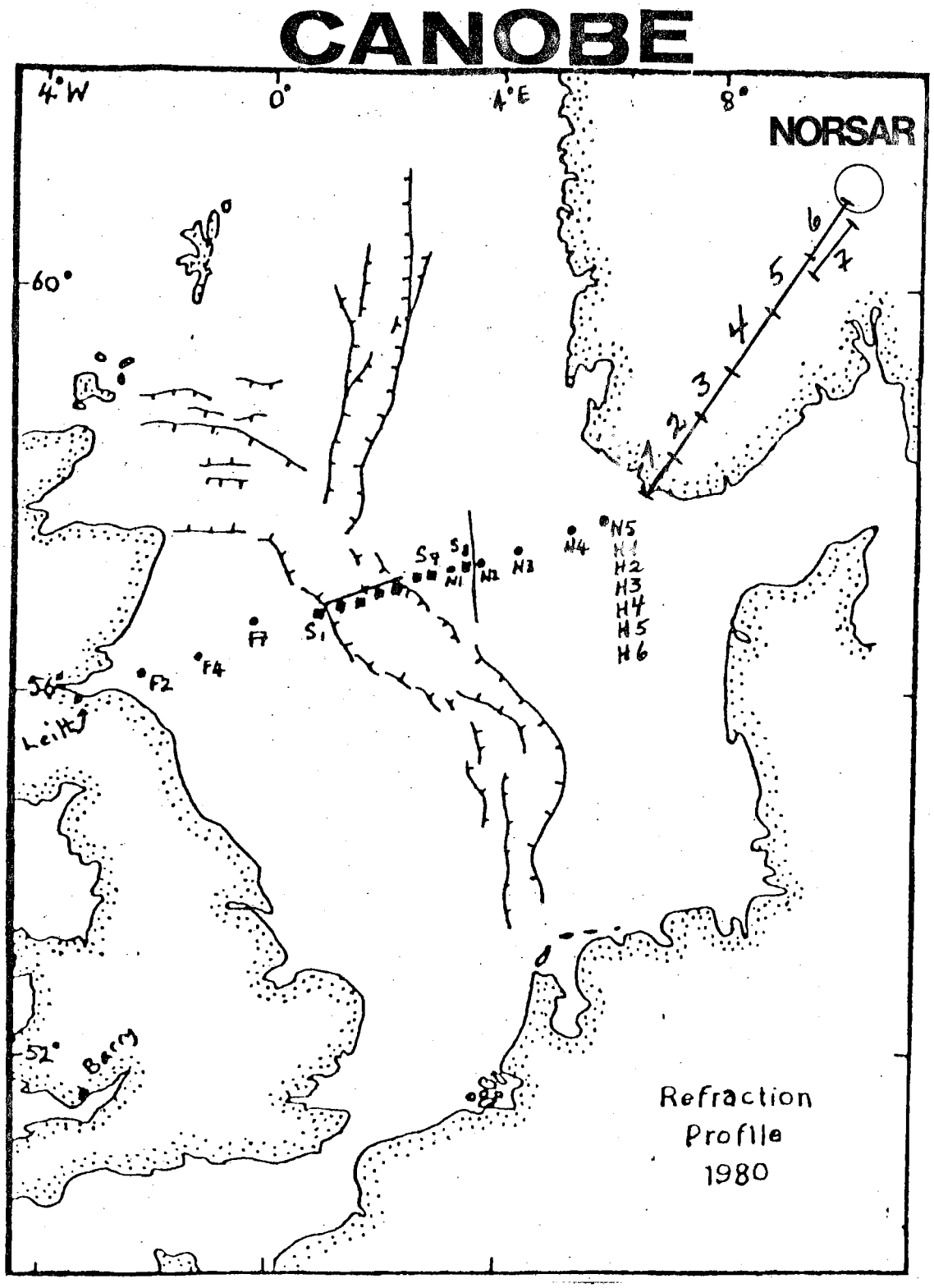

Fig. VI.2.1. Shot points and profile locations for the Cambridge-NORSAR-Bergen (CANOBE) refraction profile 1980. The location of the NORSAR seismic array is also given.

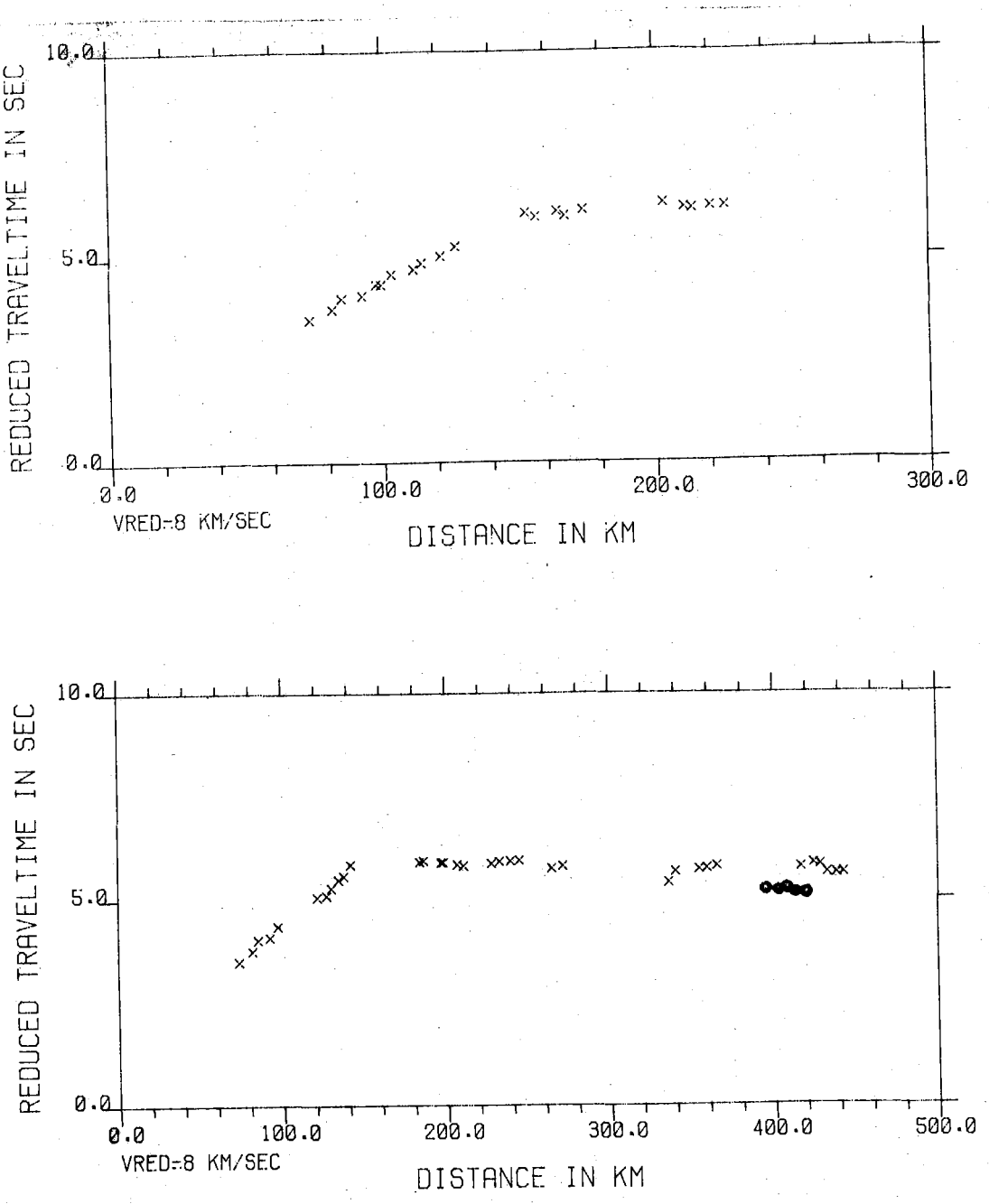

Fig. VI.2.2. Preliminary travel time curves as derived from Cambridge stations participating in the experiment. The upper frame shows travel times for the shot series N2-N5, with the stations permanently situated along leg 1 (Fig. 1). Travel times denoted by x in the lower frame refer to shots N5, H1-H5 and recording along leg 1 leg 6, while leg 7 (Oslo Graben) travel times for shot H6 are given by rings.

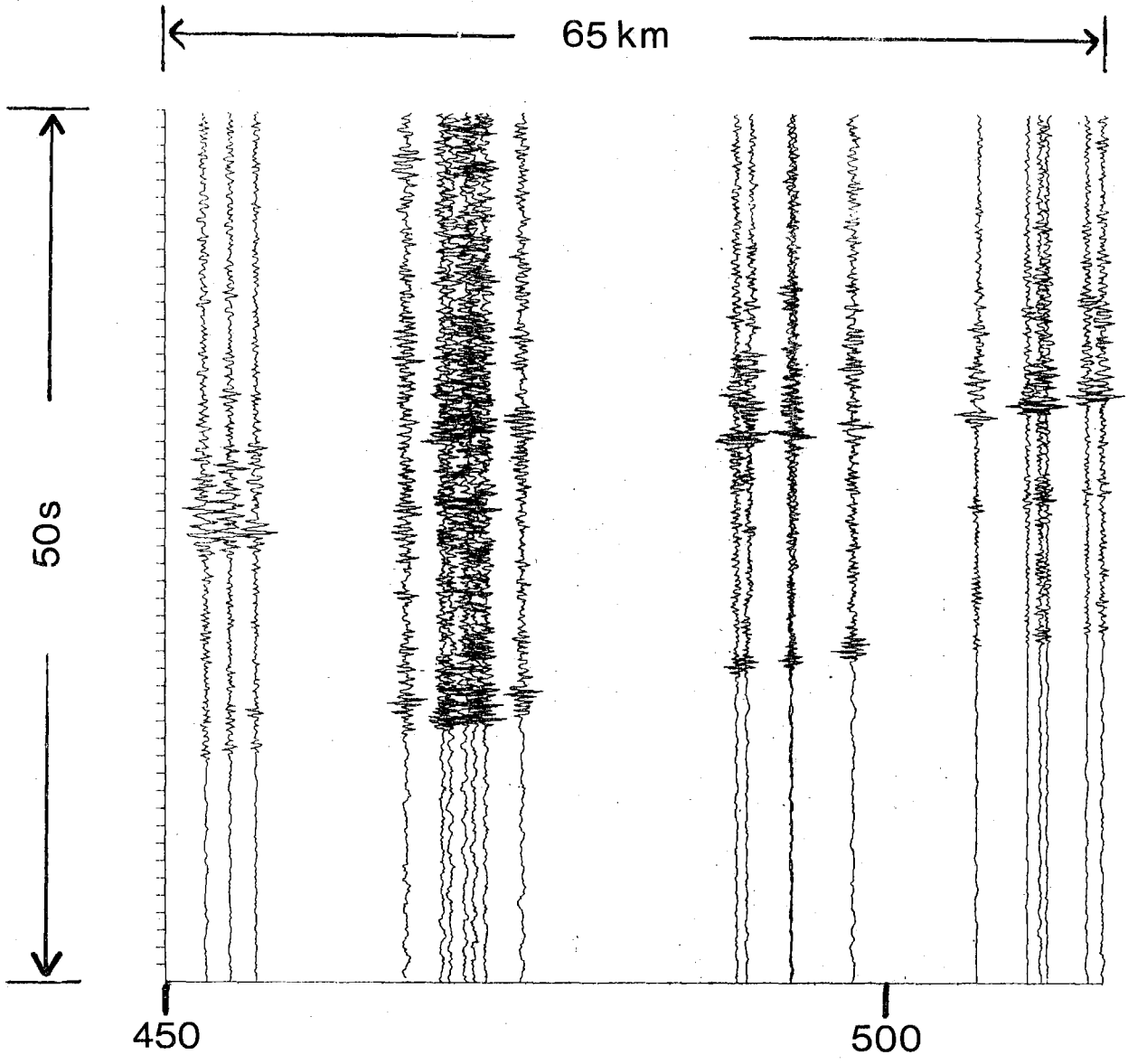

Fig. VI.2.3. NORSAR record section for shot H1, covering the distance interval 455-515 km.