



DEMERSAL FISH COMMITTEE

1978

K. Hoydal

Belgium

(R. De Clerck)

The determination of the density and the growth per year class of sole, plaice, dab, flounder and gadoids along the Belgian coast has been continued on the R.V. "Hinders".

Two cruises were carried out for the demersal young fish survey in collaboration with the Netherlands and the Federal Republic of Germany.

The market sampling was continued covering cod, North Sea; whiting, North Sea; haddock, North Sea; plaice, North Sea/English Channel/Bristol Channel/Irish Sea; sole, North Sea/English Channel/Bristol Channel/Irish Sea.

| Species/<br>Area     | Season | No. of samples |        | No. of samples |      |
|----------------------|--------|----------------|--------|----------------|------|
|                      |        | Research       | Market | Measured       | Aged |
| <u>Sole</u><br>IV    | 1      | -              | 8      | 755            | 210  |
|                      | 2      | -              | 10     | 1079           | 210  |
|                      | 4      | -              | 12     | 1275           | 210  |
| VIII f               | 1      | -              | 12     | 1297           | 210  |
|                      | 4      | -              | 7      | 893            | 210  |
| VII a                | 1      | -              | 5      | 307            | 210  |
|                      | 2      | -              | 6      | 622            | 210  |
|                      | 4      | -              | 2      | 140            | 140  |
| VII d, e             | 1-4    | -              | 11     | 974            | 480  |
| <u>Plaice</u><br>IV  | 1      | -              | 7      | 388            | 150  |
|                      | 2      | -              | 8      | 489            | 150  |
|                      | 4      | -              | 12     | 664            | 150  |
| VIII f               | 1-4    | -              | 19     | 1196           | 300  |
| VII a                | 1-4    | -              | 8      | 498            | 250  |
| VII d, e             | 1-4    | -              | 10     | 566            | 240  |
| <u>Cod</u><br>IV     | 1      | -              | 7      | 260            | 260  |
|                      | 2      | -              | 5      | 260            | 260  |
|                      | 4      | -              | 5      | 265            | 265  |
| <u>Whiting</u><br>IV | 1      | -              | 7      | 150            | 150  |
|                      | 2      | -              | 5      | 110            | 110  |
|                      | 4      | -              | 5      | 195            | 195  |
| <u>Haddock</u><br>IV | 1-4    | -              | 4      | 339            |      |

Canada

(P. F. Lett)

Nothing to report.

Denmark (with Faroe Islands)

The R.V. "Jens Chr. Svabo" took part in the Young Fish Survey in the North Sea in February/March 1978.

Sampling

| Species, Area                  | Season | No of samples   |        | No of fish |      |
|--------------------------------|--------|-----------------|--------|------------|------|
|                                |        | Research vessel | Market | Measured   | Aged |
| <u>Cod</u><br>North Sea IV     | I      | -               | 15     | 582        | 582  |
|                                | II     | -               | 11     | 636        | 636  |
|                                | III    | -               | 27     | 595        | 595  |
|                                | IV     | -               | 21     | 607        | 607  |
| Skagerrak                      | I      | -               | 9      | 360        | 360  |
|                                | II     | -               | 5      | 242        | 242  |
|                                | III    | -               | 69     | 741        | 741  |
|                                | IV     | -               | 71     | 831        | 831  |
| Kattegat                       | I      | -               | 13     | 459        | 459  |
|                                | II     | -               | 12     | 358        | 358  |
|                                | III    | -               | 36     | 615        | 615  |
|                                | IV     | -               | 36     | 623        | 623  |
| <u>Haddock</u><br>North Sea IV | I      | -               | 60     | 277        | 277  |
|                                | II     | -               | 6      | 38         | 38   |
|                                | III    | -               | 61     | 453        | 453  |
|                                | IV     | -               | 91     | 589        | 589  |
| Skagerrak                      | III    | -               | 59     | 539        | 539  |
|                                | IV     | -               | 63     | 324        | 324  |
| Kattegat                       | III    | -               | 28     | 219        | 219  |
|                                | IV     | -               | 14     | 34         | 34   |
| <u>Whiting</u><br>North Sea IV | I      | -               | 66     | 565        | 565  |
|                                | II     | -               | 38     | 147        | 147  |
|                                | III    | -               | 71     | 525        | 525  |
|                                | IV     | -               | 101    | 639        | 639  |
| Skagerrak                      | I      | -               | 1      | 64         | 64   |
|                                | II     | -               | 8      | 8          | 8    |
|                                | III    | -               | 99     | 7011       | 7011 |
|                                | IV     | -               | 80     | 3156       | 3156 |

...continued

| Species, Area                      | Season | No of samples   |        | No of fish |      |
|------------------------------------|--------|-----------------|--------|------------|------|
|                                    |        | Research vessel | Market | Measured   | Aged |
| <u>Whiting</u> (ctnd)              |        |                 |        |            |      |
| Kattegat                           | I      | -               | 8      | 144        | 144  |
|                                    | II     | -               | 9      | 57         | 57   |
|                                    | III    | -               | 44     | 4074       | 4074 |
|                                    | IV     | -               | 36     | 1404       | 1404 |
| <u>Norway Pout</u><br>North Sea IV | I      | -               | 69     | 9088       | 9088 |
|                                    | II     | -               | 7      | 593        | 593  |
|                                    | III    | -               | 69     | 4213       | 4213 |
|                                    | IV     | -               | 94     | 4133       | 4133 |
| Skagerrak                          | III    | -               | 29     | 1372       | 1372 |
|                                    | IV     | -               | 74     | 2369       | 2369 |
| Kattegat                           | III    | -               | 7      | 258        | 258  |
|                                    | IV     | -               | 20     | 552        | 552  |
| <u>Sandeel</u><br>North Sea IV     | I      | -               | 14     | 1546       | 1546 |
|                                    | II     | -               | 94     | 9082       | 9082 |
|                                    | III    | -               | 66     | 6073       | 6073 |
|                                    | IV     | -               | 9      | 850        | 850  |
| Skagerrak                          | II     | -               | 15     | 892        | 892  |
|                                    | III    | -               | 51     | 2115       | 2115 |
|                                    | IV     | -               | 4      | 62         | 62   |
| <u>Plaice</u><br>North Sea IV      | I      | -               | 6      | 467        | 467  |
|                                    | II     | -               | 6      | 1230       | 1230 |
|                                    | III    | -               | 6      | 1081       | 1081 |
|                                    | IV     | -               | 6      | 1268       | 1126 |
| Skagerrak                          | I      | -               | 8      | 1357       | 1357 |
|                                    | II     | -               | 6      | 773        | 773  |
|                                    | III    | -               | 6      | 1169       | 1169 |
|                                    | IV     | -               | 4      | 979        | 979  |
| Kattegat                           | I      | -               | 4      | 795        | 795  |
|                                    | II     | -               | 6      | 817        | 817  |
|                                    | III    | -               | 6      | 1622       | 1622 |
|                                    | IV     | -               | 6      | 1548       | 1548 |
| <u>Sole</u><br>North Sea IV        | II     | -               | 1      | 1412       | 609  |

The R.V. "Jens Chr. Svabo" worked in the Faroe area all the year except in February when it took part in the Young Fish Survey in the North Sea. During June-July "Svabo" participated in the International O-group Fish Survey in the waters around the Faroes.

Sampling on full scale was made of the three main stocks in the Faroe area and cod and haddock on Faroe Bank. Some sampling has been started on Blue Ling and Redfish from the Faroe area.

#### Sampling

| Area V <sub>b1</sub> | No. of samples | Measured | Sample weight kg | No. of sampl. | Measured | Sample weight kg |
|----------------------|----------------|----------|------------------|---------------|----------|------------------|
|                      | Cod            |          |                  | Haddock       |          |                  |
| Sear                 |                |          |                  |               |          |                  |
| Trawl                | 26             | 5130     | 13553            | 9             | 3232     | 3861             |
| Longline             | 26             | 5653     | 12776            | 15            | 6630     | 8944             |
| Handline             | 16             | 2455     | 5001             |               |          |                  |
| Gill net             | 8              | 1678     | 6406             |               |          |                  |
|                      |                | Aged     |                  |               | Aged     |                  |
| Age samples          | 56             | 2319     |                  | 19            | 1029     |                  |

#### Area V<sub>b2</sub>

|             |     |      |      |         |      |      |
|-------------|-----|------|------|---------|------|------|
|             | Cod |      |      | Haddock |      |      |
| Trawl       | 4   | 143  | 626  | 2       | 722  | 1111 |
| Longline    | 15  | 1185 | 9285 | 6       | 1292 | 2660 |
|             |     | Aged |      |         | Aged |      |
| Age samples | 14  | 649  |      | 5       | 340  |      |

#### Area V<sub>b</sub> total

|             |        |      |       |
|-------------|--------|------|-------|
|             | Saithe |      |       |
| Trawl       | 16     | 3992 | 16203 |
| Handline    | 5      | 479  | 3178  |
| Gill net    | 5      | 1421 | 6896  |
|             |        | Aged |       |
| Age samples | 22     | 1258 |       |

#### Finland

(V. Sjöblom and E. Aro)

No work was carried out on demersal fish other than that reported to the Baltic Fish Committee.

France  
(J. Guéguen)

I - Travaux réalisés par l'Institut Scientifique et Technique des Pêches Maritimes  
(ISTPM)

1) Travaux à la mer -

La "Thalassa" a participé à trois campagnes d'inventaires au cours de l'année : IYFS du 4 au 13 février en Mer du Nord, jeune lieu noir du 10 mai au 9 juin aux Feroe et poissons de fond en Mer Celtique et Mer d'Irlande du 23 novembre au 13 décembre.

La "Pélagia" a pris part à la campagne DYFS du 18 septembre au 4 octobre en Manche. Par ailleurs, pour l'étude du stock de merlu du Golfe de Gascogne, elle a effectué quatre campagnes pour l'étude de la reproduction de février à mai et une campagne de routine pour l'évaluation du recrutement du 15 au 24 novembre.

Le N.O. "Roselys" a été utilisé pour l'étude des frayères et des nurseries côtières : en avril-mai et novembre-décembre en Manche et en juin et novembre-décembre dans le golfe de Gascogne. Ces missions ont également permis d'effectuer les marquages suivants :

|          |              | <u>VII e</u> | <u>VII d</u> | <u>VIII a</u> |
|----------|--------------|--------------|--------------|---------------|
| mai-juin | { sole       | 133          | 29           | 192           |
|          | { plie       | 137          | 165          | 5             |
| décembre | raie bouclée | 36           | -            | -             |

En zone côtière des sorties mensuelles systématiques à bord de navires professionnels loués ont eu lieu toute l'année soit pour étudier les nurseries soit pour étudier les sites pressentis pour recevoir les effluents de centrales thermo nucléaires.

2) Travaux à terre -

Un échantillonnage systématique des captures débarquées par les navires commerciaux français a été poursuivi dans les ports de Boulogne, Lorient et La Rochelle. Ce travail a notamment permis de préciser les relations taille-poids pour le lieu noir, la morue, le merlan et l'églefin et de disposer de clefs taille-âge pour ces mêmes espèces.

La collecte de données sur l'effort de pêche a été poursuivie dans les ports du sud Bretagne et à la Rochelle.

## II - Travaux réalisés par d'autres organismes (CRSTOM)

### a) Centre du Congo-Pointe-Noire

L'étude d'un plan d'exploitation rationnelle des stocks de poissons démersaux du Congo est terminée et a fait l'objet d'un mémoire de thèse d'état. Actuellement les activités sur le terrain se limitent aux récoltes bimensuelles de statistiques et de données biométriques sur : Pseudotolithus typus, P. senegalensis, Galeoïdes decadactylus, Pentanemus quinquarius, Pteroscion noli et Brachydentereus auritus.

### b) Centre d'Abidjan

Les études poursuivies depuis une dizaine d'années ont pour but la mise au point de modèles de gestion rationnelle des ressources.

Un modèle concernant l'ensemble des poissons de chalut du plateau continental ivoirien est actuellement en cours d'élaboration. Les observations biologiques sont actuellement limitées à deux espèces, Pomadasys jubelini et Balistes capriscus. Cette dernière espèce pose un problème particulier : pratiquement absente avant 1970, elle est devenue à partir de 1972 le constituant le plus important de la biomasse benthique (et peut-être pélagique) au Togo, au Ghana et en Côte d'Ivoire. L'étude dynamique de ce stock exige une approche particulière car le baliste n'est pas exploité en Côte d'Ivoire. Deux campagnes de chalutage utilisant les techniques de l'échantillonnage stratifié ont permis de chiffrer à 8 000 t la biomasse de balistes vivant sur le plateau ivoirien.

Parallèlement, l'utilisation de modèles de production globaux intégrant les données de prises et d'effort disponibles depuis 1958 a permis de chiffrer le niveau moyen maximum des prises. Deux courbes d'équilibre ont été obtenues pour les périodes 1958-1971 et 1972-1977.

III - Echantillonnages effectués à bord de navires de recherches  
ou sur les marchés français.

| région       | saison    | Nb d'échantillons |        | Nb poissons<br>mesurés | Nb otolithes<br>prélevés |
|--------------|-----------|-------------------|--------|------------------------|--------------------------|
|              |           | Nav. recherche    | marché |                        |                          |
| roussette    |           |                   |        |                        |                          |
| VII c        | 2ème trim | +                 |        | 194                    |                          |
| VIII a       |           | +                 |        | 10                     |                          |
| VII c        | 4ème trim | +                 |        | 235                    |                          |
| VIII a       |           | +                 |        | 53                     |                          |
| raie bouclée |           |                   |        |                        |                          |
| VII d        | 2ème trim | +                 |        | 48                     |                          |
| VII e        |           | +                 |        | 100                    |                          |
| VIII a       |           | +                 |        | 10                     |                          |
| VII d        | 3ème trim | +                 |        | 111                    |                          |
| VII e        |           | +                 |        | 118                    |                          |
| VII a        | 4ème trim | 5                 |        | 476                    |                          |
| VII c        |           | +                 |        | 169                    |                          |
| VII f        |           | 2                 |        | 37                     |                          |
| VII g        |           | 5                 |        | 65                     |                          |
| VIII a       |           |                   |        | 23                     |                          |
| merlu        |           |                   |        |                        |                          |
| VIII ab      | 1er trim  |                   | 18     | 2 701                  |                          |
| VIII c       |           |                   | +      | 569                    |                          |
| IV           | 2ème trim | +                 |        | 64                     |                          |
| VII c        |           |                   | )      | 263                    |                          |
| f            |           |                   | )      | 421                    |                          |
| g            |           |                   | )      | 219                    |                          |
| h            |           |                   | )      | 447                    |                          |
| VIII ab      |           | +                 | 10     | 5 104                  |                          |
| VII f        | 3ème trim |                   | )      | 637                    |                          |
| h            |           |                   | )      | 796                    |                          |
| VIII a b     |           |                   | 7      | 384                    |                          |
| VII a        | 4ème trim | 3                 |        | 41                     |                          |
| VII c        |           |                   | )      | 227                    |                          |
| f            |           | 5                 | )      | 589                    |                          |
| h            |           |                   | )      | 232                    |                          |
| g            |           | 11                | )      | 306                    |                          |
| VIII a b     |           | ++                | 3      | 7 424                  | 984                      |
| cabillaud    |           |                   |        |                        |                          |
| IV           | 1er trim  | +                 |        | 2 648                  | 609                      |
| VI a         |           |                   | 2      | 194                    |                          |
| VII a        |           |                   | 2      | 345                    |                          |
| VII f        |           |                   | 2      | 369                    |                          |
| VII g        |           |                   | 1      | 124                    |                          |

| région            | saison    | Nb d'échantillons |        | Nb poissons<br>mesurés | Nb otolithes<br>prélevés |
|-------------------|-----------|-------------------|--------|------------------------|--------------------------|
|                   |           | Nav. recherche    | marché |                        |                          |
| cabillaud (suite) |           |                   |        |                        |                          |
| IV                | 2ème trim | +                 |        | 217                    | 217                      |
| V b               |           | +                 |        | 4 749 juv              |                          |
| VI a              |           |                   | 3      | 420                    |                          |
| VII a             |           |                   | 1      | 319                    |                          |
| VII f             |           |                   | 1      | 230                    |                          |
| VII g             |           |                   | 2      | 230                    |                          |
| VI a              | 3ème trim |                   | 2      | 399                    |                          |
| VII a             |           |                   | 2      | 238                    |                          |
| VII g             |           |                   | 2      | 664                    |                          |
| VI a              | 4ème trim |                   | 1      | 293                    |                          |
| VII a             |           | 4                 | 2      | 438                    | 110                      |
| VII g             |           | 6                 | 3      | 457                    | 30                       |
| VII d             |           |                   | 1      | 29                     |                          |
| merlan            |           |                   |        |                        |                          |
| IV                | 1er trim  | +                 |        | 6 559                  | 1 283                    |
| VI a              |           |                   | 1      | 264                    |                          |
| VII a             |           |                   | 1      | 115                    |                          |
| VII f             |           |                   | 3      | 897                    |                          |
| IV                | 2ème trim | +                 |        | 1 477                  | 429                      |
| VI a              |           |                   | 2      | 520                    |                          |
| VII a             |           |                   | 3      | 980                    |                          |
| VII b             |           |                   | 1      | 66                     |                          |
| VII d             |           | +                 |        | 1 074                  |                          |
| VII e             |           | +                 |        | 165                    |                          |
| VII f             |           |                   | 3      | 623                    |                          |
| VII g             |           |                   | 1      | 283                    |                          |
| VIII a            |           | +                 |        | 24 086                 |                          |
| IV                | 3ème trim | +                 |        | 120                    |                          |
| VI a              |           |                   | 2      | 472                    |                          |
| VII a             |           |                   | 1      | 307                    |                          |
| VII d             |           | +++               |        | 2 726                  |                          |
| VII e             |           | +                 |        | 41                     |                          |
| VII f             |           |                   | 2      | 432                    |                          |
| VII g             |           |                   | 3      | 505                    |                          |
| IV                | 4ème trim | +                 | 1      | 314                    | 244                      |
| VI a              |           |                   | 1      | 252                    |                          |
| VII a             |           | 12                | 2      | 1 741                  | 120                      |
| VII d             |           | +                 |        | 438                    |                          |
| VII e             |           | +                 |        | 1 918                  |                          |
| VII f             |           | 4                 |        | 233                    | 150                      |
| VII g             |           | 13                | 1      | 914                    | 160                      |
| VIII a            |           | +                 |        | 5 642                  |                          |

| région     | saison    | Nb d'échantillons |        | Nb poissons<br>mesurés | Nb otolithes<br>prélevés |
|------------|-----------|-------------------|--------|------------------------|--------------------------|
|            |           | Nav. recherche    | marché |                        |                          |
| églefin    |           |                   |        |                        |                          |
| IV         | 1er trim  | +                 |        | 4 091                  | 325                      |
| VI a       |           |                   | 3      | 1 218                  |                          |
| VII f      |           |                   | 1      | 140                    |                          |
| IV         | 2ème trim | +                 |        | 1 898                  | 240                      |
| VI a       |           |                   | 2      | 541                    |                          |
| VII f      |           |                   | 1 + 1  | 310                    |                          |
| VII g      |           |                   | 1      | 214                    |                          |
| VI a       | 3ème trim |                   | 2      | 445                    |                          |
| VII a      |           |                   | 1      | 187                    |                          |
| IV         | 4ème trim |                   | 1      | 126                    |                          |
| VI a       |           |                   | 2      | 439                    |                          |
| VII a      |           |                   | 1      | 228                    |                          |
| VII c      |           | 1                 |        | 14                     |                          |
| VII g      |           | 4                 | 1      | 218                    | 41                       |
| lieu noir  |           |                   |        |                        |                          |
| VI a       | 1er trim  |                   | 3      | 678                    | 130                      |
| IV         | 2ème trim | +                 |        | 1 809                  | 305                      |
| VI a       |           |                   | 2      | 443                    | 146                      |
| V b        |           | 1                 |        | 4 790 juv.             |                          |
| VI a       | 3ème trim |                   | 4      | 918                    | 150                      |
| VII f      |           |                   | 1      | 120                    |                          |
| VI a       | 4ème trim |                   | 2      | 488                    | 170                      |
| VII g      |           | 1                 |        | 17                     |                          |
| lieu jaune |           |                   |        |                        |                          |
| VII g      | 4ème trim |                   | 1      | 72                     |                          |
| tacaud     |           |                   |        |                        |                          |
| IV         | 1er trim  | +                 |        | 424                    | 48                       |
| VII d      |           | +                 |        | 6                      |                          |
| VII c      |           | +                 |        | 6                      |                          |
| IV c       | 2ème trim | +                 |        | 693                    |                          |
| VII d      |           | ++                |        | 4 625                  |                          |
| VII c      |           | ++                |        | 3 408                  |                          |
| VIII a     |           | +                 |        | 124 959                |                          |
| IV c       | 3ème trim | +                 |        | 1 989                  |                          |
| VII d      |           | ++                |        | 3 507                  |                          |
| VII c      |           | ++                |        | 705                    |                          |
| IV c       | 4ème trim | +                 |        | 142                    |                          |
| VII a      |           | 6                 |        | 108                    |                          |
| VII d      |           | +                 |        | 2 303                  |                          |
| VII c      |           | +                 |        | 3 314                  |                          |
| VII f      |           | 5                 |        | 140                    |                          |
| VII g      |           | 1                 |        | 10                     |                          |
| VIII a     |           | +                 |        | 3 057                  |                          |

| région        | saison    | Nb d'échantillons |        | Nb poissons<br>mesurés | Nb otolithes<br>prélevés |
|---------------|-----------|-------------------|--------|------------------------|--------------------------|
|               |           | Nav. recherche    | marché |                        |                          |
| mulet         |           |                   |        |                        |                          |
| VIII a        | 2ème trim | +                 |        | 1 163                  |                          |
| rouget        |           |                   |        |                        |                          |
| VII d         | 2ème trim | +                 |        | 4                      |                          |
| VII e         |           | ++                |        | 21                     |                          |
| VII d         | 3ème trim | +                 |        | 7                      |                          |
| VII e         |           | +                 |        | 7                      |                          |
| VII d         | 4ème trim | +                 |        | 6                      |                          |
| VII e         |           | ++                |        | 43                     |                          |
| VIII a        |           | ++                |        | 185                    |                          |
| bar           |           |                   |        |                        |                          |
| VIII a        | 2ème trim | +                 |        | 701                    |                          |
| dorade grise  |           |                   |        |                        |                          |
| VIII a        | 1er trim  |                   | 1      | 161                    |                          |
| VII d         | 2ème trim | +                 |        | 11                     |                          |
| VII e         |           | +                 |        | 416                    |                          |
| VIII a        |           | +                 |        | 15                     |                          |
| VII a         | 4ème trim | 1                 |        | 5                      |                          |
| VII e         |           | +                 | 1      | 1 882                  |                          |
| VII f         |           | 1                 |        | 3                      |                          |
| VII g         |           | 1                 |        | 7                      |                          |
| VIII a        |           | +                 | 1      | 989                    |                          |
| grondin rouge |           |                   |        |                        |                          |
| VII a         | 4ème trim | 4                 |        | 105                    |                          |
| VII e         |           | 1                 |        | 45                     |                          |
| VII f         |           | 4                 |        | 228                    |                          |
| VII g         |           | 3                 |        | 31                     |                          |
| sardine       |           |                   |        |                        |                          |
| VII a         | 4ème trim | 2                 |        | 12                     |                          |
| VII c         |           | 1                 |        | 9                      |                          |
| VII f         |           | 1                 |        | 3                      |                          |
| VII g         |           | 7                 | 1      | 255                    |                          |
| plie          |           |                   |        |                        |                          |
| IV            | 1er trim  | +                 |        | 976                    |                          |
| VII d e       |           | +                 |        | 12                     |                          |
| IV c          | 2ème trim | +                 |        | 52                     |                          |
| VII d         |           | ++                |        | 2 595                  |                          |
| VII e         |           | ++                |        | 1 027                  |                          |
| VIII a        |           | +                 |        | 26                     |                          |
| IV c          | 3ème trim | +                 |        | 250                    |                          |
| VII d         |           | +                 |        | 2 612                  | 836                      |
| VII e         |           | +                 |        | 703                    |                          |

| région       | saison    | Nb d'échantillons |        | Nb poissons mesurés | Nb otolithes prélevés |
|--------------|-----------|-------------------|--------|---------------------|-----------------------|
|              |           | Nav. recherche    | marché |                     |                       |
| plie (suite) |           |                   |        |                     |                       |
| IV c         | 4ème trim | +                 |        | 148                 |                       |
| VII d        |           | +                 |        | 886                 |                       |
| VII e        |           | +                 |        | 399                 |                       |
| VII g        |           | 6                 | 1      | 165                 |                       |
| VIII a       |           | +                 |        | 61                  |                       |
| VII f        |           | 1                 |        | 26                  |                       |
| VII a        |           | 7                 |        | 187                 |                       |
| flétan       |           |                   |        |                     |                       |
| IV           | 1er trim  | +                 |        | 108                 |                       |
| VII d        | 3ème trim | +                 |        | 183                 |                       |
| limande      |           |                   |        |                     |                       |
| IV           | 1er trim  | +                 |        | 3 577               |                       |
| VII d e      |           | +                 |        | 3                   |                       |
| IV c         | 2ème trim | +                 |        | 12                  |                       |
| VII d        |           | +                 |        | 1 957               |                       |
| VII e        |           | +                 |        | 72                  |                       |
| VIII a       |           | +                 |        | 48                  |                       |
| IV c         | 3ème trim | +                 |        | 346                 |                       |
| VII d        |           | +++               |        | 5 902               |                       |
| VII e        |           | +                 |        | 6                   |                       |
| IV c         | 4ème trim | +                 |        | 272                 |                       |
| VII d        |           | +                 |        | 2 393               |                       |
| VII e        |           | +                 |        | 9                   |                       |
| VII a        |           | 11                |        | 475                 |                       |
| VII f        |           | 2                 |        | 16                  |                       |
| VII g        |           | 7                 |        | 112                 |                       |
| VIII a       |           | +                 |        | 99                  |                       |
| sole         |           |                   |        |                     |                       |
| VII d c      | 1er trim  | +                 |        | 92                  |                       |
| IV c         | 2ème trim | +                 |        | 28                  |                       |
| VII d        |           | ++                |        | 517                 |                       |
| VII e        |           | ++                |        | 557                 |                       |
| VIII a       |           | ++                |        | 4 508               |                       |
| IV c         | 3ème trim | +                 |        | 248                 |                       |
| VII d        |           | +++               |        | 1 271               |                       |
| VII e        |           |                   |        | 2 239               |                       |
| VII g        |           |                   | 1      | 65                  |                       |
| IV c         | 4ème trim | +                 |        | 202                 |                       |
| VII d        |           | +                 |        | 564                 |                       |
| VII e        |           | ++                |        | 816                 |                       |
| VIII a       |           | +                 |        | 97                  |                       |
| VII a        |           | 3                 |        | 32                  |                       |
| VII f        |           | 3                 |        | 47                  |                       |
| VII g        |           | 2                 |        | 14                  |                       |

230

| région   | saison    | Nb d'échantillons |        | Nb poissons mesurés | Nb otolithes prélevés |
|----------|-----------|-------------------|--------|---------------------|-----------------------|
|          |           | Nav. recherche    | marché |                     |                       |
| côteau   |           |                   |        |                     |                       |
| VIII a   | 2ème trim | +                 |        | 90                  |                       |
| baudroie |           |                   |        |                     |                       |
| VIII a   | 2ème trim | +                 |        | 40                  |                       |
| VII g    | 3ème trim |                   | 1      | 67                  |                       |
| VII c    | 4ème trim | 1                 |        | 4                   |                       |
| VII g    |           |                   | 1      | 152                 |                       |

Centre Abidjan

Tableau récapitulatif des mensurations de poissons démersaux effectuées en 1978

| Espèces                            | Nb échantillons | Nb individus |
|------------------------------------|-----------------|--------------|
| <u>Galeoïdes decadactylus</u>      | 280             | 19 881       |
| <u>Pomadasys jubelini</u>          | 191             | 13 839       |
| <u>Brachydeuterus auritus</u>      | 56              | 3 506        |
| <u>Pseudotolithus senegalensis</u> | 264             | 17 039       |
| <u>Dentex angolensis</u>           | 39              | 2 790        |
| <u>Pagellus coupei</u>             | 24              | 1 545        |
| <u>Cynoglossus spp.</u>            | 61              | 3 528        |
| Divers                             | 5               | 297          |
| Total                              | 920             | 62 425       |

Centre Pointe-Noire

| Espèces                       | Nombre d'individus mesuré |            |            |            | Totaux      |
|-------------------------------|---------------------------|------------|------------|------------|-------------|
|                               | 1er trim.                 | 2ème trim. | 3ème trim. | 4ème trim. |             |
| <u>Pseudotolithus typus</u>   | 983 (6)                   | 514 (5)    | 251 (5)    | 789 (5)    | 2 537 (21)  |
| <u>P. senegalensis</u>        | 3 724 (6)                 | 2 190 (5)  | 2 052 (5)  | 2 200 (5)  | 10 166 (21) |
| <u>Galeoïdes decadactylus</u> | 1 664 (6)                 | 1 151 (5)  | 1 266 (5)  | 1 253 (5)  | 5 334 (21)  |
| <u>Pentanemus quinquarius</u> | 1 079 (6)                 | 1 015 (5)  | 893 (5)    | 1 011 (5)  | 3 997 (21)  |
| <u>Pteroscion peli</u>        | 1 103 (6)                 | 930 (5)    | 866 (5)    | 977 (5)    | 3 876 (21)  |
| <u>Brachydeuterus auritus</u> | 862 (6)                   | 742 (5)    | 589 (4)    | 517 (4)    | 2 710 (19)  |

( ) : nombre d'échantillons analysé.

German Democratic Republic

(H. Schultz)

Sampling Data

| Area                         | Season | No. of Samples  |                        |        | No. of fish |      |                  |
|------------------------------|--------|-----------------|------------------------|--------|-------------|------|------------------|
|                              |        | Research vessel | Commer-<br>cial vessel | Market | measured    | aged | racial invest.   |
| <u>COD</u>                   |        |                 |                        |        |             |      |                  |
| IIb                          | III    | 7               | -                      | -      | 716         | 229  | -                |
| <u>SAITHE</u>                |        |                 |                        |        |             |      |                  |
| IIa                          | I      | 26              | -                      | -      | 2869        | 913  | 32 <sup>1)</sup> |
| IVa                          | I      | 2               | -                      | -      | 298         | 298  |                  |
|                              | III    | 2               | -                      | -      | 533         | 300  |                  |
| <u>REDFISH(S. mentella)</u>  |        |                 |                        |        |             |      |                  |
| IIa                          | II     | -               | 64                     | -      | 13009       | 745  | -                |
|                              | III    | -               | 30                     | -      | 7213        | 571  | -                |
|                              | III    | 1               | -                      | -      | 230         | 93   | -                |
| IIb                          | III    | -               | 8                      | -      | 2489        | -    | -                |
|                              | III    | 21              | -                      | -      | 4291        | 644  | -                |
| XIVb                         | III    | -               | 9                      | -      | 113         | -    | -                |
| <u>REDFISH(S. marinus)</u>   |        |                 |                        |        |             |      |                  |
| IIa                          | I      | 3               | -                      | -      | 840         | 193  | -                |
| <u>REDFISH(S. viviparus)</u> |        |                 |                        |        |             |      |                  |
| IIa                          | I      | 3               | -                      | -      | 427         | -    | -                |
| <u>GREENLAND HALIBUT</u>     |        |                 |                        |        |             |      |                  |
| IIa                          | IV     | -               | -                      | 1      | 511         | 282  | -                |
| IIb                          | III    | 13              | -                      | -      | 2794        | 1220 | -                |

1) parasitological analysis

Research Vessel Surveys

| Area                      | Date                          | Objectives                       |
|---------------------------|-------------------------------|----------------------------------|
| S-Spitsbergen-Kopytov     | 14 - 25 Jul.<br>31 Jul-3 Aug. | Blue whiting-redfish survey      |
| Bear-Island-S-Spitsbergen | 26-30 Jul                     | Greenland halibut-redfish survey |
| Reykjanes                 | 6 - 8 Jul                     | Redfish, experimental trawling   |

Federal Republic of Germany

(G. Rauck)

Continuation of the Wadden Sea sampling programme along the German coast with special reference to juvenile plaice, sole, dab, flounder, cod, haddock and whiting (joint Demersal Young Fish Survey in collaboration with the Netherlands and Belgium).

The market sampling (length distribution, otoliths) on demersal fish species from the North Sea and the North Atlantic was continued.

Sampling data on length measurements, otoliths, sex, maturity stages, etc. on board commercial and research vessels was continued as in the previous year.

Research Vessel Surveys

| Area                                                            | Date                                                           | Objectives                                                                                                                                 |
|-----------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Faroes, Shetlands                                               | R.V. Anton Dohrn                                               | Blue Whiting                                                                                                                               |
|                                                                 | 10.01.-26.01.1978                                              |                                                                                                                                            |
| Bear Island<br>Spitzbergen                                      | 12.06.-20.07.1978                                              | Ground fish survey                                                                                                                         |
| North Sea<br>- " -<br>- " -<br>- " -<br>- " -<br>- " -<br>- " - | R.V. Solea                                                     | Ground fish survey<br>Sole fishing<br>Sole fishing<br>Ground fish survey<br>Ground fish survey<br>Ground fish survey<br>Ground fish survey |
|                                                                 | 05.01.-26.01.1978                                              |                                                                                                                                            |
|                                                                 | 17.05.-30.05.1978                                              |                                                                                                                                            |
|                                                                 | 17.07.-31.07.1978                                              |                                                                                                                                            |
|                                                                 | 08.08.-19.08.1978                                              |                                                                                                                                            |
|                                                                 | 18.10.-27.10.1978                                              |                                                                                                                                            |
|                                                                 | 02.11.-15.11.1978                                              |                                                                                                                                            |
|                                                                 | 20.11.-01.12.1978                                              |                                                                                                                                            |
| Div. IV a, II a<br>IV a, II a                                   | Sampling on board commercial<br>vessel sterntrawler "Erlangen" | Ground fish trawling                                                                                                                       |
|                                                                 | 28.12.1977-10.04.1978                                          |                                                                                                                                            |
|                                                                 | 20.04.1978-05.07.1978                                          |                                                                                                                                            |
| North Atl.                                                      | chartered stern trawler<br>"Marburg"                           | Blue Whiting                                                                                                                               |
|                                                                 | 18.08.-22.12.1978                                              |                                                                                                                                            |

| Species Area                                                            | Season | Research Vessel Samples |             |       |                             | No. of Samples | Market Samples |            |
|-------------------------------------------------------------------------|--------|-------------------------|-------------|-------|-----------------------------|----------------|----------------|------------|
|                                                                         |        | No. of Samples          | No. of Fish |       | No. Of Fish                 |                |                |            |
|                                                                         |        |                         | Measured    | Aged  | Racial Investig-<br>ationnn |                | Measured       | Aged       |
| Cod Fla                                                                 | I      | --                      | --          | --    | --                          | 3<br>25 x)     | 639<br>4 847   | 369<br>595 |
|                                                                         | II     | --                      | --          | --    | --                          | 1<br>9 x)      | 237<br>562     | 117<br>305 |
|                                                                         | III    | --                      | --          | --    | --                          | 6 x)           | 332            | 268        |
|                                                                         | IV     | --                      | --          | --    | --                          | 2 x)           | 222            | 65         |
| IIb                                                                     | I      | --                      | --          | --    | --                          | --             | --             | --         |
|                                                                         | II     | --                      | --          | --    | --                          | --             | --             | --         |
|                                                                         | III    | 21                      | 171         | 121   | --                          | --             | --             | --         |
|                                                                         |        | --                      | --          | --    | --                          | 3 x)           | 117            | 117        |
|                                                                         | IV     | --                      | --          | --    | --                          | 4 x)           | 158            | 74         |
| IVa                                                                     | I      | --                      | --          | --    | --                          | 14 x)          | 1 863          | 310        |
|                                                                         |        | 28                      | 490         | 470   | --                          | --             | --             | --         |
|                                                                         | II     | --                      | --          | --    | --                          | 1 x)           | 42             | 42         |
|                                                                         | III    | 25                      | 377         | --    | --                          | 5 x)           | 87             | 83         |
|                                                                         | IV     | 2                       | 116         | --    | --                          | --             | --             | --         |
| IVb                                                                     | I      | 102                     | 7 429       | 1 349 | --                          | --             | --             | --         |
|                                                                         | II     | 8                       | 502         | --    | --                          | --             | --             | --         |
|                                                                         | III    | 39                      | 1 137       | 476   | --                          | --             | --             | --         |
|                                                                         | IV     | 43                      | 209         | --    | --                          | --             | --             | --         |
| x) Samples taken on board commercial vessels by technician of institute |        |                         |             |       |                             |                |                |            |

| Species Area   | Season                                                               | Research Vessel Samples |             |       |                             | No. of Samples | Market Samples |              |     |
|----------------|----------------------------------------------------------------------|-------------------------|-------------|-------|-----------------------------|----------------|----------------|--------------|-----|
|                |                                                                      | No. of Samples          | No. of Fish |       | Racial Investig-<br>ationnn |                | No. Of Fish    |              |     |
|                |                                                                      |                         | Measured    | Aged  |                             |                | Measured       | Aged         |     |
| Cod XIV        | I                                                                    | --                      | --          | --    | --                          | 2              | 718            | 272          |     |
|                | II                                                                   | --                      | --          | --    | --                          | 3              | 1 011          | 123          |     |
|                | III                                                                  | --                      | --          | --    | --                          | 2              | 571            | 146          |     |
| Haddock<br>IIa | I                                                                    | --                      | --          | --    | --                          | 5<br>20 x)     | 1 973<br>3 590 | 553<br>713   |     |
|                | II                                                                   | --                      | --          | --    | --                          | 1<br>27 x)     | 386<br>4 315   | 145<br>1 760 |     |
|                | III                                                                  | --                      | --          | --    | --                          | 3<br>5 x)      | 232<br>405     | 63<br>114    |     |
|                | IV                                                                   | --                      | --          | --    | --                          |                |                |              |     |
|                | IIb                                                                  | IV                      | --          | --    | --                          | 2 x)           | 142            | 70           |     |
|                | IVa                                                                  | I                       | 29          | 6 886 | 1 075                       | --             | 8 x)           | 1 467        | 243 |
|                | II                                                                   | --                      | --          | --    | --                          | 2 x)           | 219            | 219          |     |
|                | III                                                                  | 20                      | 2 058       | --    | --                          | 4 x)           | 499            | 149          |     |
|                | IV                                                                   | 2                       | 116         | --    | --                          | 2 x)           | 200            | 54           |     |
|                | IVb                                                                  | I                       | 18          | 2 300 | 349                         | --             | --             | --           | --  |
|                |                                                                      | III                     | 12          | 2 155 | 224                         | --             | --             | --           | --  |
| IV             |                                                                      | 17                      | 1 491       | --    | --                          | --             | --             | --           |     |
| Whiting<br>IVa | I                                                                    | 26                      | 1 896       | --    | --                          | --             | --             | --           |     |
|                | III                                                                  | 12                      | 272         | --    | --                          | --             | --             | --           |     |
|                | IV                                                                   | 1                       | 415         | --    | --                          | --             | --             | --           |     |
|                | x) Samples taken on board commercial vessels by institute technician |                         |             |       |                             |                |                |              |     |

| Species Area                                     | Season | Research Vessel Samples |             |      |                             | No. of Samples | Market Samples |       |
|--------------------------------------------------|--------|-------------------------|-------------|------|-----------------------------|----------------|----------------|-------|
|                                                  |        | No. of Samples          | No. of Fish |      |                             |                | No. Of Fish    |       |
|                                                  |        |                         | Measured    | Aged | Racial Investig-<br>ationnn |                | Measured       | Aged  |
| Whiting<br>IVb                                   | I      | 35                      | 6 441       | --   | --                          | --             | --             | --    |
|                                                  | II     | 1                       | 173         | --   | --                          | --             | --             | --    |
|                                                  | III    | 11                      | 1 268       | --   | --                          | --             | --             | --    |
|                                                  | IV     | 14                      | 2 539       | --   | --                          | --             | --             | --    |
| Coalfish<br>IIa<br><br>IVa<br><br>IVb<br><br>IVa | I      | --                      | --          | --   | --                          | 9              | 3 538          | 1 692 |
|                                                  | II     | --                      | --          | --   | --                          | 8              | 2 380          | 722   |
|                                                  | III    | --                      | --          | --   | --                          | 3              | 712            | 712   |
|                                                  | IV     | --                      | --          | --   | --                          | 4              | 901            | 662   |
|                                                  | I      | --                      | --          | --   | --                          | 3              | 857            | 857   |
|                                                  | II     | --                      | --          | --   | --                          | 6              | 1 698          | 705   |
|                                                  | III    | 13                      | 421         | --   | --                          | 6              | 1 526          | 637   |
|                                                  | IV     | 1                       | 435         | --   | --                          | 2              | 516            | 148   |
|                                                  | I      | --                      | --          | --   | --                          | 2              | 525            | 247   |
|                                                  | II     | --                      | --          | --   | --                          | 5              | 1 068          | 775   |
|                                                  | III    | --                      | --          | --   | --                          | 2              | 393            | 202   |
|                                                  | IV     | --                      | --          | --   | --                          | 1              | 85             | 85    |
|                                                  | I      | --                      | --          | --   | --                          | --             | --             | --    |
|                                                  | II     | --                      | --          | --   | --                          | 2              | 460            | 460   |
| Norway Pout<br>IVa<br><br>IVb                    | I      | 16                      | 1 896       | --   | --                          | --             | --             | --    |
|                                                  | III    | 7                       | 980         | --   | --                          | --             | --             | --    |
|                                                  | IV     | 1                       | 326         | --   | --                          | --             | --             | --    |
|                                                  | I      | 30                      | 5 322       | --   | --                          | --             | --             | --    |
|                                                  | IV     | 3                       | 302         | --   | --                          | --             | --             | --    |

| Species Area            | Season | Research Vessel Samples |             |       |             | No. of Samples | Market Samples |                             |
|-------------------------|--------|-------------------------|-------------|-------|-------------|----------------|----------------|-----------------------------|
|                         |        | No. of Samples          | No. of Fish |       | No. of Fish |                | Aged           |                             |
|                         |        |                         | Measured    | Aged  |             |                |                | Racial Investig-<br>ationnn |
| Redfish <sup>++</sup>   |        |                         |             |       |             |                |                |                             |
| IIa                     | I      | --                      | --          | --    | --          | 8              | 1 622          | 198                         |
|                         | II     | --                      | --          | --    | --          | 5              | 536            | 440                         |
|                         | III    | --                      | --          | --    | --          | 3              | 155            | 253                         |
|                         | IV     | --                      | --          | --    | --          | 2              | 205            | 130                         |
| I and IIb <sup>++</sup> | III    | 5                       | 297         | 194   | --          | --             | --             | --                          |
| oo                      | III    | 16                      | 2 676       | 824   | --          | --             | --             | --                          |
| Vb <sup>++</sup>        | II     | --                      | --          | --    | --          | 3              | --             | 340                         |
| ++                      | IV     | --                      | --          | --    | --          | 1              | --             | 131                         |
| oo                      | I      | --                      | --          | --    | --          | 3              | 627            | 233                         |
| oo                      | II     | --                      | --          | --    | --          | 6              | 570            | 411                         |
| oo                      | III    | --                      | --          | --    | --          | 4              | 837            | --                          |
| oo                      | IV     | --                      | --          | --    | --          | 2              | 197            | 112                         |
| XIV <sup>++</sup>       | I      | --                      | --          | --    | --          | 2              | 425            | --                          |
|                         | II     | --                      | --          | --    | --          | 6              | 617            | 621                         |
|                         | III    | --                      | --          | --    | --          | 3              | 515            | 222                         |
| oo                      | IV     | --                      | --          | --    | --          | 5              | 741            | 130                         |
|                         | I      | --                      | --          | --    | --          | 5              | 1 269          | --                          |
|                         | III    | --                      | --          | --    | --          | 6              | 912            | 264                         |
|                         | IV     | --                      | --          | --    | --          | 5              | 1 111          | 136                         |
| Plaice                  |        |                         |             |       |             |                |                |                             |
| IVb                     | I      | 26                      | 1 067       | --    | --          | 5              | 5 619          | 1 357                       |
|                         | II     | 7                       | 637         | --    | --          | 5              | 5 370          | 1 532                       |
|                         | III    | 36                      | 464         | 65    | --          | 8              | 5 200          | 855                         |
|                         | IV     | 18                      | 687         | --    | --          | 4              | 3 460          | 949                         |
| Sole                    |        |                         |             |       |             |                |                |                             |
| IVb                     | I      | 2                       | 23          | --    | --          | --             | --             | --                          |
|                         | II     | 71                      | 5 756       | 1 260 | --          | 14             | 8 990          | 501                         |
|                         | III    | 31                      | 298         | 158   | --          | 11             | 3 142          | 780                         |
|                         | IV     | 2                       | 81          | --    | --          | 18             | 3 298          | 1 158                       |
| ++ <u>S. marinus</u>    |        |                         |             |       |             |                |                |                             |
| oo <u>S. mentella</u>   |        |                         |             |       |             |                |                |                             |

| Species Area | Season | Research Vessel Samples |             |      |                             | No. of Samples | Market Samples |       |
|--------------|--------|-------------------------|-------------|------|-----------------------------|----------------|----------------|-------|
|              |        | No. of Samples          | No. of Fish |      |                             |                | No. Of Fish    |       |
|              |        |                         | Measured    | Aged | Racial Investig-<br>ationnn |                | Measured       | Aged  |
| Turbot IVb   | I      | 8                       | 31          | --   | --                          | --             | --             | --    |
|              | II     | 60                      | 152         | 103  | --                          | 5              | 1 171          | 1 039 |
|              | III    | 3                       | 3           | --   | --                          | 4              | 555            | 550   |
|              | IV     | --                      | --          | --   | --                          | 1              | 403            | 270   |

Iceland  
(J. Magnússon)

The research work on demersal species of fish was carried out in Iceland along the same lines as in previous years, both on landed demersal fish and on research vessel catches. The collection of data on landed demersal fish was intensified particularly on redfish, Greenland halibut and ocean catfish.

The three branches of the Marine Research Institute were operated the whole year with the same tasks as in previous years. The visiting fishery inspectors collected a considerable amount of length measurement data from demersal fish, particularly cod.

The research vessel "Bjarni Sæmundsson" was engaged in work on demersal species with "Hafþór" also taking part in the first months of the year.

The research programme on the distribution of mature cod just before and during the spawning period was continued, as well as the research programmes on the immature population of cod and on the behaviour of cod in the area NW of Iceland.

The number of fish sampled is shown in the following tables.

Sampling Data

PLAICE

| Area   | Season     | No. of samples  |                | No. of fish |      |        |
|--------|------------|-----------------|----------------|-------------|------|--------|
|        |            | Research vessel | Market samples | Measured    | Aged | Tagged |
| Va     | Jan.- Mar. | 3               |                | 1054        | 404  | 1500   |
|        | Apr.-Jun.  | 2               |                |             | 302  |        |
|        | Jul.-Sep.  | 2               | 6              | 1052        | 1500 | 501    |
|        | Oct.-Dec.  |                 | 2              |             | 400  |        |
| Total: |            | 7               | 8              | 2106        | 2606 | 2001   |

SILVER SMELT

| Area         | Season     | No. of samples   |                | No. of fish |      |
|--------------|------------|------------------|----------------|-------------|------|
|              |            | Research vessels | Market samples | Measured    | Aged |
| Va           | Jan.-Mar.  | 5                |                | 33          |      |
| "            | Apr.- Jun. | 32               |                | 1654        | 300  |
| "            | Jul.-Sep.  | 67               |                | 2393        | 187  |
| Sub. total:  |            | 104              |                | 4080        | 487  |
| XIV          | Jan.-Mar.  | 4                |                | 4           |      |
| Grand total: |            | 108              |                | 4084        | 487  |

Sampling Data

Lepidion eques

| Area  | Season    | No. of samples   |                | No. of fish |      |
|-------|-----------|------------------|----------------|-------------|------|
|       |           | Research vessels | Market samples | Measured    | Aged |
| Va.   | Jan.-Mar. | 11               |                | 54          |      |
| "     | Apr.-Jun. | 12               |                | 322         |      |
| "     | Jul.-Sep. | 13               |                | 505         |      |
| Total |           | 36               |                | 881         |      |

LING

| Area  | Season    | No. of samples   |                | No. of fish |      |
|-------|-----------|------------------|----------------|-------------|------|
|       |           | Research vessels | Market samples | Measured    | Aged |
| Va    | Apr.-Jun  | 9                |                | 20          |      |
| "     | Jul.-Sep  | 6                |                | 11          |      |
| "     | Oct.-Dec. | 3                |                | 4           |      |
| Total |           | 18               |                | 35          |      |

BLUE LING

| Area        | Season    | No. of samples   |                | No. of fish |      |
|-------------|-----------|------------------|----------------|-------------|------|
|             |           | Research vessels | Market samples | Measured    | Aged |
| Va          | Jan.-Mar  | 13               |                | 71          | 23   |
| "           | Apr.-Jun  | 28               |                | 297         | 162  |
| "           | Jul.-Sep  | 78               |                | 912         | 354  |
| "           | Oct.-Dec. | 8                |                | 42          |      |
| "           | "         |                  | 1              | 214         |      |
| Sub. total: |           | 127              | 1              | 1536        | 539  |
| XIV         | Jan.-Mar  | 6                |                | 6           | 20   |
| Grand total |           | 133              | 1              | 1542        | 559  |

Sampling Data

TUSK

| Area        | Season    | No. of samples   |                | No. of fish |      |
|-------------|-----------|------------------|----------------|-------------|------|
|             |           | Research vessels | Market samples | Measured    | Aged |
| Va          | Jan.-Mar. | 5                |                | 11          |      |
| "           | Apr.-Jun. | 20               |                | 194         |      |
| "           | Jul.-Sep. | 46               |                | 226         |      |
| "           | Oct.-Dec. | 2                |                | 2           |      |
| Sub total   |           | 73               |                | 433         |      |
| XIV         | Jan.-Mar  | 7                |                | 22          |      |
| Grand total |           | 80               |                | 455         |      |

WHITING

| Area  | Season    | No. of samples   |                | No. of fish |      |
|-------|-----------|------------------|----------------|-------------|------|
|       |           | Research vessels | Market samples | Measured    | Aged |
| Va    | Jan.-Mar. | 3                |                | 32          |      |
| "     | Apr.-Jun. | 6                |                | 243         |      |
| "     | Oct.-Dec. | 5                |                | 57          |      |
| Total |           | 14               |                | 332         |      |

ROUNDNOSE GRENADIER

| Area  | Season    | No. of samples |  | No. of fish |     |
|-------|-----------|----------------|--|-------------|-----|
| Va    | Jan.-Mar. | 20             |  | 1594        | 686 |
| "     | Apr.-Jun. | 9              |  | 406         | 282 |
| "     | Jul.-Sep. | 13             |  | 596         | -   |
| Total |           | 42             |  | 2596        | 968 |

NORWAY POULT

| Area | Season    | No. of samples   |                | No. of fish |      |        |
|------|-----------|------------------|----------------|-------------|------|--------|
|      |           | Research vessels | Market samples | Measured    | Aged | Tagged |
| Va   | Jan.-Mar. | -                | -              | -           | -    | -      |
|      | Apr.-Jun. | 3                | 0              | 389         | 55   | 0      |
|      | Jul.-Sep. | 1                | 0              | 676         | 275  | 0      |
|      | Oct.-Dec. | 4                | 0              | 708         | 165  | 0      |
|      |           | 8                | 0              | 1773        | 495  | 0      |

HALIBUT

| Area | Season    | No. of samples   |                | No. of fish |      |        |
|------|-----------|------------------|----------------|-------------|------|--------|
|      |           | Research vessels | Market samples | Measured    | Aged | Tagged |
| Va   | Jan.-Mar. | 2                | 0              | 162         | 132  | 0      |
|      | Apr.-Jun. | 5                | 0              | 195         | 141  | 14     |
|      | Jul.-Sep. | 2                | 0              | 6           | 0    | 0      |
|      | Oct.-Dec. | 1                | 0              | 328         | 69   | 259    |
|      |           | 10               | 0              | 691         | 342  | 273    |

GREENLAND HALIBUT

| Area        | Season     | No. of samples   |                | No. of fish |      |        |
|-------------|------------|------------------|----------------|-------------|------|--------|
|             |            | Research vessels | Market samples | Measured    | Aged | Tagged |
| Va          | Jan.-Mar.  | -                | -              | -           | -    | -      |
|             | Apr.-Jun.  | 7                | 11             | 3690        | 1404 |        |
|             | July-Sept. | 14               | 3              | 964         | 900  | 1231   |
|             | Oct.-Dec.  |                  |                | 390         |      |        |
| XIV         |            | 21               | 14             | 5044        | 2304 | 1231   |
|             | Jan.-Mar.  | 5                |                | 173         | 200  |        |
|             | Apr.-Jun.  | 4                |                | 426         | 400  |        |
| Sub. total: |            | 9                |                | 599         | 600  |        |
| Total:      |            | 30               | 14             | 5643        | 2904 | 1231   |

Sampling Data

ROUGHHEAD GRENADIER

| Area | Season    | No. of samples   |                | No. of fish |      |
|------|-----------|------------------|----------------|-------------|------|
|      |           | Research vessels | Market samples | Measured    | Aged |
| Va   | Jan.-Mar. | 11               |                | 31          |      |
|      | Jul.-Sep. | 8                |                | 11          |      |
|      |           | 19               |                | 42          |      |
| XIV  | Jan.-Mar. | 12               |                | 377         | 219  |

CATFISH (Anarrhicas lupus)

| Area | Season    | No. of samples   |                | No. of fish |      |      |
|------|-----------|------------------|----------------|-------------|------|------|
|      |           | Research vessels | Market samples | Measured    | Aged |      |
| Va   | Jan.-Mar. | 2                | 1              | 185         | 107  | 72   |
|      | Apr.-Jun. | 6                | 1              | 1679        | 840  | 331  |
|      | Jul.-Sep. | 2                | 0              | 381         | 350  | 22   |
|      | Oct.-Dec. | 2                | 0              | 3063        | 912  | 1055 |
|      |           | 12               | 2              | 5308        | 2209 | 1480 |

CATFISH (A. minor)

| Area | Season    | No. of samples   |                | No. of fish |      |        |
|------|-----------|------------------|----------------|-------------|------|--------|
|      |           | Research vessels | Market samples | Measured    | Aged | Tagged |
|      | Jan.-Mar. | 2                | 0              | 7           |      | 75     |
|      | Apr.-Jun. | 4                | 0              | 17          |      |        |
|      | Jul.-Sep. | 2                | 0              | 20          |      |        |
|      | Oct.-Dec. | 3                | 0              | 102         | 8    | 63     |
|      |           | 11               | 0              | 146         | 8    | 138    |

Sampling Data

REDFISH

| Area         | Season    | No. of samples      |                | No. of fish |      |
|--------------|-----------|---------------------|----------------|-------------|------|
|              |           | Research vessels    | Market samples | Measured    | Aged |
|              |           | <u>S. marinus</u>   |                |             |      |
| Va           | Jan.-Mar. | 70                  |                | 3179        | 100  |
| "            | "         |                     | 4              | 698         |      |
| "            | Apr.-Jun. | 36                  |                | 2202        |      |
| "            | "         |                     | 13             | 2289        | 100  |
| "            | Jul.-Sep. | 119                 |                | 8016        |      |
| "            | "         |                     | 17             | 2205        | 600  |
| "            | Oct.-Dec. | 37                  |                | 2606        |      |
| "            | "         |                     | 12             | 1409        | 199  |
| XIV          | Jan.-Mar. | 10                  |                | 204         |      |
| Sub. total:  |           | 272                 | 46             | 22808       | 999  |
|              |           | <u>S. mentella</u>  |                |             |      |
| Va           | Jan.-Mar. | 8                   |                | 274         |      |
| "            | "         |                     | 1              | 61          |      |
| "            | Apr.-Jun. | 40                  |                | 2465        |      |
| "            | "         |                     | 8              | 1054        |      |
| "            | Jul.-Sep. | 79                  |                | 8378        |      |
| "            | "         |                     | 2              | 3           |      |
| "            | Oct.-Dec. |                     | 4              | 344         |      |
| XIV          | Jan.-Mar. | 10                  |                | 334         |      |
| Sub. total:  |           | 137                 | 15             | 12913       |      |
|              |           | <u>S. viviparus</u> |                |             |      |
| Va           | Jan.-Mar. | 2                   |                | 60          |      |
| "            | Apr.-Jun. | 8                   |                | 926         | 100  |
| "            | Jul.-Sep. | 41                  |                | 2354        |      |
| "            | Okt.-Dec. | 1                   |                | 34          |      |
| XIV          | Jan.-     | 2                   |                | 8           |      |
| Sub. total:  |           | 54                  |                | 3382        | 100  |
| Grand total: |           | 463                 | 61             | 39103       | 1099 |

Sampling Data

SAITHE

| Area  | Season    | No. of samples   |                | No. of fish |      |        |
|-------|-----------|------------------|----------------|-------------|------|--------|
|       |           | Research vessels | Market samples | Measured    | Aged | Tagged |
| Va    | Jan.-Mar. | 7                |                | 303         | -    | -      |
| "     | "         |                  | 7              | 1059        | 398  | -      |
| "     | Apr.-Jun. | 30               |                | 2404        | 497  | -      |
| "     | "         |                  | 18             | 1934        | 303  | -      |
| "     | July-Sep. | 23               |                | 2000        | 438  | -      |
| "     | "         |                  | 13             | 1203        | 200  | -      |
| "     | Oct.-Dec. | 20               |                | 2421        | 200  | -      |
| "     | "         |                  | 9              | 1215        | 100  | -      |
| Total |           | 80               | 47             | 12539       | 2136 | -      |

COD

| Area  | Season    | No. of samples   |                | No. of fish. |       |        |
|-------|-----------|------------------|----------------|--------------|-------|--------|
|       |           | Research vessels | Market samples | Measured     | Aged  | Tagged |
| Va    | Jan.-Mar. | 190              |                | 25720        | 1738  | 1467   |
| "     | " "       |                  | 38             | 5981         | 1278  | -      |
| "     | Apr.-Jun. | 245              |                | 42865        | 1899  | 122    |
| "     | " "       |                  | 61             | 8349         | 1789  | -      |
| "     | July-Sep. | 277              |                | 50044        | 1697  | 323    |
| "     | " "       |                  | 58             | 9149         | 674   | -      |
| "     | Oct.-Dec. | 178              |                | 21669        | 1247  | 99     |
| "     | " "       |                  | 28             | 3955         | 502   | -      |
| Total |           | 890              | 185            | 167732       | 10824 | 2011   |
| XIV   | Jan-Mar   | 4                | -              | 40           | -     | -      |

Sampling Data

HADDOCK

| Area  | Season    | No. of samples   |                | No. of fish |      |        |
|-------|-----------|------------------|----------------|-------------|------|--------|
|       |           | Research vessels | Market samples | Measured    | Aged | Tagged |
| Va    | Jan.-Mar. | 53               |                | 6897        | 402  | -      |
| "     | "         |                  | 16             | 3150        | 580  | -      |
| "     | Apr.-Jun. | 71               |                | 9245        | 709  | -      |
| "     | "         |                  | 26             | 3413        | 696  | -      |
| "     | July-Sep. | 52               |                | 6018        | 303  | -      |
| "     | "         |                  | 15             | 2185        | 100  | -      |
| "     | Oct.-Dec. | 71               |                | 7944        | 304  | -      |
| "     | "         |                  | 6              | 500         | 100  | -      |
| Total |           | 247              | 63             | 39352       | 3194 | -      |

Ireland

(J.P. Hillis)

Cod, haddock, whiting and plaice taken in commercial catches were sampled at the port in Divisions VIa, VIIa, VIIb,c and VIIg-k (excluding haddock in VIIa) and sole in VIIg-k only. Small scale examination of discards at Killybegs in Division VIa was continued.

Plaice

Beam trawl surveys for juveniles were carried out during 2-11 May and 26 September - 5 October covering 43 stations each in inshore waters off the east coast between latitudes 52°15'N and 54°00'N in Division VIIa, yielding 376 and 682 juvenile plaice respectively.

SAMPLING DATA

| Species | Division,<br>Port                      | Season | No. of<br>samples<br>(all market) | No. of fish |                   |
|---------|----------------------------------------|--------|-----------------------------------|-------------|-------------------|
|         |                                        |        |                                   | Measured    | Otoliths<br>taken |
| COD     | VIa<br>Killybegs                       | 1      | 4                                 | 215         | 76                |
|         |                                        | 2      | 16                                | 329         | 314               |
|         |                                        | 3      | 9                                 | 222         | 95                |
|         |                                        | 4      | 4                                 | 433         | 126               |
|         | Greencastle                            | 1      | 2                                 | 229         | 81                |
|         |                                        | 2      | 2                                 | 314         | 129               |
|         |                                        | Total  | 37                                | 1 742       | 821               |
|         | VIIa<br>Howth                          | 1      | 5                                 | 514         | 285               |
|         |                                        | 2      | 5                                 | 517         | 194               |
|         |                                        | 3      | 3                                 | 406         | 129               |
|         |                                        | 4      | 2                                 | 310         | 207               |
|         | Kilmore Quay                           | 1      | 1                                 | 57          | 56                |
|         |                                        | 2      | 3                                 | 293         | 115               |
|         |                                        | Total  | 19                                | 2 097       | 986               |
|         | VIIb,c<br>Galway                       | 1      | 4                                 | 313         | 208               |
|         |                                        | 2      | 9                                 | 123         | 126               |
|         |                                        | 4      | 12                                | 255         | 116               |
|         |                                        | Total  | 25                                | 691         | 450               |
|         | VIIg-k<br>Castletownbere<br>and Dingle | 1      | 6                                 | 254         | 47                |
|         |                                        | 2      | 9                                 | 56          | 48                |
|         |                                        | 3      | 2                                 | 84          | 78                |
|         |                                        | 4      | 2                                 | 124         | -                 |
|         |                                        | Total  | 19                                | 518         | 173               |
|         | OVERALL TOTAL                          |        | 100                               | 5 048       | 2 430             |
| HADDOCK | VIa<br>Killybegs                       | 1      | 2                                 | 61          | 20                |
|         |                                        | 2      | 6                                 | 736         | 237               |
|         |                                        | 3      | 8                                 | 641         | 121               |
|         |                                        | 4      | 2                                 | 248         | 63                |
|         | Greencastle                            | 2      | 1                                 | 204         | 90                |
|         |                                        | Total  | 19                                | 1 890       | 531               |
|         | VIIb,c<br>Galway                       | 2      | 2                                 | 31          | 31                |
|         |                                        | 4      | 2                                 | 127         | 39                |
|         |                                        | Total  | 4                                 | 158         | 70                |
|         | VIIg-k<br>Castletownbere<br>and Dingle | 1      | 4                                 | 105         | 32                |
|         |                                        | 2      | 3                                 | 35          | 33                |
|         |                                        | 3      | 3                                 | 55          | 55                |
|         |                                        | 4      | 2                                 | 181         | 38                |
|         |                                        | Total  | 12                                | 376         | 159               |
|         | OVERALL TOTAL                          |        | 35                                | 2 424       | 760               |

| Species | Division,<br>Port                                   | Season | No. of<br>samples<br>(all market) | No. of fish |                   |
|---------|-----------------------------------------------------|--------|-----------------------------------|-------------|-------------------|
|         |                                                     |        |                                   | Measured    | Otoliths<br>taken |
| WHITING | VIa<br>Killybegs                                    | 1      | 5                                 | 1 143       | 133               |
|         |                                                     | 2      | 4                                 | 868         | 251               |
|         |                                                     | 3      | 4                                 | 1 447       | 111               |
|         |                                                     | 4      | 4                                 | 1 044       | 65                |
|         | Greencastle                                         | 2      | 1                                 | 496         | 96                |
|         |                                                     | Total  | 18                                | 4 998       | 656               |
|         | VIIa<br>Howth                                       | 1      | 3                                 | 505         | 172               |
|         |                                                     | 2      | 3                                 | 791         | 225               |
|         |                                                     | 3      | 2                                 | 583         | 136               |
|         |                                                     | 4      | 3                                 | 983         | 157               |
|         |                                                     | Total  | 11                                | 2 862       | 690               |
|         | VIIb,c<br>Galway                                    | 1      | 4                                 | 512         | 145               |
|         |                                                     | 3      | 3                                 | 1 102       | 112               |
|         |                                                     | Total  | 7                                 | 1 614       | 157               |
|         | VIIg-k<br>Castletownbere<br>Dingle and<br>Unionhall | 1      | 1                                 | 171         | 39                |
|         |                                                     | 2      | 3                                 | 764         | 159               |
|         |                                                     | 3      | 6                                 | 1 075       | 314               |
|         |                                                     | 4      | 2                                 | 472         | 48                |
|         |                                                     | Total  | 12                                | 2 482       | 560               |
|         | OVERALL TOTAL                                       |        | 48                                | 11 956      | 2 063             |

| Species | Division,<br>Port                                   | Season | No. of<br>samples<br>(all market) | No. of fish |      |                |      |
|---------|-----------------------------------------------------|--------|-----------------------------------|-------------|------|----------------|------|
|         |                                                     |        |                                   | Measured    |      | Otoliths taken |      |
|         |                                                     |        |                                   | M           | F    | M              | F    |
| PLAICE  | VIa<br>Killybegs                                    | 1      | 2                                 | 224         | 184  | 31             | 15   |
|         |                                                     | 2      | 7                                 | 547         | 477  | 172            | 172  |
|         |                                                     | 3      | 4                                 | 493         | 426  | 97             | 105  |
|         |                                                     | 4      | 5                                 | 983         | 601  | 126            | 106  |
|         | Greencastle                                         | 2      | 2                                 | 356         | 334  | 77             | 122  |
|         |                                                     | Total  | 20                                | 2247        | 2022 | 503            | 520  |
|         | VIIa<br>Howth                                       | 1      | 1                                 | 302         | 115  | 66             | 58   |
|         |                                                     | 2      | 3                                 | 54          | 259  | 35             | 74   |
|         |                                                     | 3      | 2                                 | 145         | 203  | 69             | 93   |
|         |                                                     | 4      | 1                                 | 91          | 132  | 49             | 74   |
|         | Kilmore Quay                                        | 1      | 1                                 | 299         | 79   | 75             | 76   |
|         |                                                     | 2      | 3                                 | 207         | 353  | 67             | 119  |
|         |                                                     | Total  | 11                                | 828         | 1141 | 361            | 495  |
|         | VIIb,c<br>Galway                                    | 1      | 1                                 | 234         | 173  | 68             | 82   |
|         |                                                     | 2      | 1                                 | 160         | 242  | 81             | 112  |
|         |                                                     | 3      | 7                                 | 665         | 553  | 123            | 152  |
|         |                                                     | 4      | 2                                 | 325         | 307  | 66             | 81   |
|         |                                                     | Total  | 11                                | 1384        | 1275 | 338            | 437  |
|         | VIIg-k<br>Castletownbere<br>etc.                    | 1      | 2                                 | 22          | 73   | -              | 67   |
|         |                                                     | 2      | 5                                 | 397         | 498  | 54             | 93   |
|         |                                                     | 3      | 5                                 | 390         | 477  | 153            | 209  |
|         |                                                     | 4      | 2                                 | 134         | 123  | -              | -    |
|         |                                                     | Total  | 14                                | 943         | 1171 | 207            | 369  |
|         | OVERALL                                             | TOTAL  | 54                                | 5402        | 5609 | 1409           | 1821 |
| SOLE    | VIIg-k<br>Castletownbere<br>Dingle and<br>Unionhall | 2      | 3                                 | 116         | 184  | 27             | 48   |
|         |                                                     | 3      | 1                                 | 53          | 51   | 18             | 21   |
|         |                                                     | TOTAL  | 4                                 | 169         | 235  | 45             | 69   |

Netherlands

(J.F.de Veen)

Work at sea.

In 1976 the RV "Willem Beukelsz" was taken out of service. The "Koningin Juliana", designed to be used for research and instruction for fishery schools, did not fulfil the expectations and in 1978 a number of commercial ships have been chartered to act as research ships. The RV "Tridens" made 16 cruises in the area of the Council of which 10 were mainly devoted to work within the scope of the Demersal Fish Committee. The commercial beamtrawler "KW 34" carried out 5 trips of which 1 was for demersal purposes. The corresponding figures for the cutter "WR 17" was 4 and 4 and for the sterntrawler "VL 115" 1 and 1. The RV "Stern" made 30 trips of which 26 were devoted to demersal topics and the RV "Schollevaar" 10 trips of which 10 were for demersal aims. The RV "Stern", RV "Schollevaar", RV "Tridens" and the cutter "WR 17" made two joint cruises, one in April-May and one in September-October to analyse the stocks of juvenile sole, plaice, dab, flounder, gadoids, brown shrimps and other organisms in the nurseries of Belgium, Holland, Federal Republic of Germany and part of Denmark in cooperation with Belgian and German research vessels. The cutter "KW 34" made one cruise in May to the eastern part of the Irish Sea to analyse the stocks of juvenile fish there.

Work on fish.

Plaice

The stock analysis by means of market sampling from different sub-stocks in the North Sea was continued with the emphasis on the first quarter in the spawning season. Analysis of the catches of young fish cruises (April-May and September-October) in the southern and central North Sea continental coasts showed that the 1977 yearclass was somewhat below average but the 1978 year

class was very good

In addition to the prerecruit-surveys for O- and I-group flatfish a special programme for estimating the numbers of O- and I-group plaice and brown shrimp, and of benthos on the tidal flats has been carried out throughout the year.

#### Sole

The stock analysis by means of market sampling from different localities in the North Sea, Irish Sea and the Gulf of Biscay was continued.

One cruise was devoted to the Irish Sea for census purposes. Analysis of the catches of pre-recruit sole in Belgian, Dutch, German and Danish coastal areas showed that the 1977 yearclass was poor and of the order of the poor 1974 yearclass. The first impression is that the 1978 one is good and of the order of the good 1976 yearclass.

#### Dab

No stock analysis through market sampling is possible because of the variable and high discarding rate at sea. During the juvenile fish cruises in spring and autumn the age structure of the dab population in the nurseries and at sea has been analysed.

#### Cod

The analysis of cod stocks by means of market sampling was continued.

#### Saithe

The analysis of saithe stocks by means of market sampling was continued.

#### Cod, Haddock and Whiting

The RV "Tridens" participated in the ICES Young Fish Surveys in February for estimating abundance of I-year old gadoids and in summer for estimating O-group abundance of gadoids during the pelagic phase. The sterntrawler "VL 115" made an additional survey for estimating the O-group strength.

#### Discards

Discarding at sea of flatfish and gadoid species has been studied throughout the year in various areas in the North Sea on board of the following commercial ships: HA 13, HA 35, HD 4, HD 27, GO 4, GO 25, KW 74, KW 149, KW 152, TX 34, UK 2, UK 52, UK 90, UK 193, UQ 1, VD 19, VD 73, WR 123, WR 136, WR 226, IJM 154.

1978 Sampling Data for PLAICE

| Area             | Season      | No. of samples for age determination only |        | Number of Fish    |                      |
|------------------|-------------|-------------------------------------------|--------|-------------------|----------------------|
|                  |             | Research Vessel                           | Market | Measured and aged | Racial investigation |
| IIIa             | 2nd quarter | 1                                         | 1      | 215               | 215                  |
|                  | 4th quarter | 1                                         | -      | 137               | 137                  |
| IVb              | 1st quarter | -                                         | 81     | 5 670             | 5 670                |
|                  | 2nd quarter | 10                                        | 21     | 2 272             | 2 272                |
|                  | 3rd quarter | -                                         | 12     | 840               | 840                  |
|                  | 4th quarter | 12                                        | 6      | 1 195             | 1 195                |
| IVc              | 1st quarter | -                                         | 16     | 1 120             | 1 120                |
|                  | 2nd quarter | 8                                         | 6      | 857               | 857                  |
|                  | 3rd quarter | -                                         | 7      | 490               | 490                  |
|                  | 4th quarter | 10                                        | 9      | 1 189             | 1 189                |
| VIIa             | 1st quarter | -                                         | 2      | 140               | 140                  |
|                  | 2nd quarter | 4                                         | -      | 611               | 611                  |
|                  | 3rd quarter | -                                         | -      | -                 | -                    |
|                  | 4th quarter | -                                         | -      | -                 | -                    |
| Dutch Wadden-sea | 2nd quarter | 6                                         | -      | 295               | 295                  |
|                  | 4th quarter | 7                                         | -      | 425               | 425                  |
| Zeeland Estuary  | 2nd quarter | 6                                         | -      | 89                | 89                   |
|                  | 4th quarter | 2                                         | -      | 166               | 166                  |
| Total annually   |             | 67                                        | 161    | 15 711            | 15 711               |

1978 Sampling Data for SOLE

| Area                   | Season      | No. of samples for age determination only |        | Number of Fish    |                      |
|------------------------|-------------|-------------------------------------------|--------|-------------------|----------------------|
|                        |             | Research Vessel                           | Market | Measured and aged | Racial investigation |
| IIIa                   | 2nd quarter | 1                                         | -      | 2                 | 2                    |
|                        | 4th quarter | 1                                         | -      | 5                 | 5                    |
| IVb                    | 1st quarter | -                                         | 16     | 800               | 800                  |
|                        | 2nd quarter | 8                                         | 64     | 3 334             | 3 334                |
|                        | 3rd quarter | -                                         | 11     | 550               | 550                  |
|                        | 4th quarter | 9                                         | 15     | 1 076             | 1 076                |
| IVc                    | 1st quarter | -                                         | 4      | 200               | 200                  |
|                        | 2nd quarter | 8                                         | 35     | 2 031             | 2 031                |
|                        | 3rd quarter | -                                         | 6      | 300               | 300                  |
|                        | 4th quarter | 8                                         | 7      | 674               | 647                  |
| VIIa                   | 1st quarter | -                                         | 3      | 150               | 150                  |
|                        | 2nd quarter | 4                                         | 11     | 983               | 983                  |
|                        | 3rd quarter | -                                         | -      | -                 | -                    |
|                        | 4th quarter | -                                         | -      | -                 | -                    |
| VIII<br>Gulf of Biscay | 2nd quarter | -                                         | -      | -                 | -                    |
| Dutch Waddensea        | 2nd quarter | 6                                         | -      | 66                | 66                   |
|                        | 4th quarter | 7                                         | -      | 106               | 106                  |
| Zeeland Estuary        | 2nd quarter | 5                                         | -      | 65                | 65                   |
|                        | 4th quarter | 2                                         | -      | 117               | 117                  |
| Total annually         |             | 59                                        | 172    | 10 459            | 10 459               |

1978 Sampling Data for DAB

| Area                   | Season      | No. of samples for age determination only |        | Number of Fish    |                      |
|------------------------|-------------|-------------------------------------------|--------|-------------------|----------------------|
|                        |             | Research Vessel                           | Market | Measured and aged | Racial investigation |
| IIIa                   | 2nd quarter | 1                                         | -      | 75                | 75                   |
|                        | 4th quarter | 1                                         | -      | 62                | 62                   |
| IVb                    | 1st quarter | -                                         | -      | -                 | -                    |
|                        | 2nd quarter | 9                                         | -      | 643               | 643                  |
|                        | 3rd quarter | -                                         | -      | -                 | -                    |
|                        | 4th quarter | 14                                        | -      | 742               | 742                  |
| IVc                    | 1st quarter | -                                         | -      | -                 | -                    |
|                        | 2nd quarter | 8                                         | -      | 466               | 466                  |
|                        | 3rd quarter | -                                         | -      | -                 | -                    |
|                        | 4th quarter | 8                                         | -      | 435               | 435                  |
| VIIa                   | 1st quarter | -                                         | -      | -                 | -                    |
|                        | 2nd quarter | 4                                         | -      | 359               | 359                  |
|                        | 3rd quarter | -                                         | -      | -                 | -                    |
|                        | 4th quarter | -                                         | -      | -                 | -                    |
| VIII<br>Gulf of Biscay | 2nd quarter | -                                         | -      | -                 | -                    |
| Dutch Waddensea        | 2nd quarter | 6                                         | -      | 136               | 136                  |
|                        | 4th quarter | 7                                         | -      | 214               | 214                  |
| Zeeland Estuary        | 2nd quarter | ?                                         | -      | ?                 | ?                    |
|                        | 4th quarter | 2                                         | -      | 166               | 166                  |
| Total annually         |             | 60                                        | -      | 3 298             | 3 298                |

1978 Sampling Data for COD

| Area                                  | Season      | No. of samples for age determination only |        | Number of Fish         |                    |                      |
|---------------------------------------|-------------|-------------------------------------------|--------|------------------------|--------------------|----------------------|
|                                       |             | Research Vessel                           | Market | Measured <sup>1)</sup> | Aged <sup>2)</sup> | Racial investigation |
| IV                                    | 1st quarter | 21                                        | 8      | 3 165                  | 2 038              | -                    |
|                                       | 2nd quarter | -                                         | 10     | 2 804                  | 528                | -                    |
|                                       | 3rd quarter | 3                                         | 10     | 2 141                  | 707                | -                    |
|                                       | 4th quarter | -                                         | 8      | 2 588                  | 395                | -                    |
| Total annually                        |             | 24                                        | 36     | 10 698                 | 3 668              | -                    |
| 1978 Sampling Data for <u>HADDOCK</u> |             |                                           |        |                        |                    |                      |
| IV                                    | 1st quarter | 13                                        | 6      | 1 173                  | 868                | -                    |
|                                       | 2nd quarter | -                                         | 4      | 834                    | 190                | -                    |
|                                       | 3rd quarter | 3                                         | 8      | 883                    | 605                | -                    |
|                                       | 4th quarter | -                                         | 4      | 751                    | 176                | -                    |
| Total annually                        |             | 16                                        | 22     | 3 641                  | 1 839              | -                    |
| 1978 Sampling Data for <u>WHITING</u> |             |                                           |        |                        |                    |                      |
| IV                                    | 1st quarter | 17                                        | 6      | 3 118                  | 1 583              | -                    |
|                                       | 2nd quarter | -                                         | 6      | 2 562                  | 299                | -                    |
|                                       | 3rd quarter | 3                                         | 14     | 2 572                  | 562                | -                    |
|                                       | 4th quarter | -                                         | 7      | 3 959                  | 397                | -                    |
| Total annually                        |             | 20                                        | 33     | 12 211                 | 2 841              | -                    |
| 1978 Sampling Data for <u>SAITHE</u>  |             |                                           |        |                        |                    |                      |
| IV                                    | 1st quarter | -                                         | 11     | 515                    | 1 741              | -                    |
|                                       | 2nd quarter | -                                         | 3      | 319                    | 140                | -                    |
|                                       | 3rd quarter | 2                                         | 4      | 179                    | 255                | -                    |
|                                       | 4th quarter | -                                         | 4      | 520                    | 200                | -                    |
| Total annually                        |             | 2                                         | 22     | 1 533                  | 2 331              | -                    |

Norway  
(C.J. Rørvik)

Sub-areas I and II

The research activities at sea were nearly the same in 1978 as in the last years. The distribution of young cod and haddock were investigated during a combined acoustic and trawl survey in the Barents Sea in February - March. In February - March the concentrations of mature Arcto-Norwegian cod were charted in Lofoten. The investigations on larvae and post-larvae of cod were continued in April with a survey in Lofoten. In April - May the resources of redfish, Greenland halibut and blue whiting in the Vesterålen - Bear Island area were studied with one research vessel. In August - September the annual international 0-group fish survey was carried out in the Barents Sea. In October - November the distribution and abundance of cod, haddock, redfish and blue whiting were investigated in the Bear Island - West Spitsbergen area.

Tagging experiments of the major roundfish species were continued. In March - April mature cod were tagged in Lofoten. In June young saithe were tagged in the southern part of Division IIa. In August - September cod and haddock were tagged in the coastal waters of northern Norway.

The abundance of 0-group saithe in the littoral zone was studied at selected localities along the Norwegian coast in September - October.

Market sampling of Recommendation 4 species was continued. The sampling of Recommendation 2 fisheries was continued.

Sub-area IV

The sampling of Recommendation 2 fisheries in Division IVa was continued.

As part of international surveys the distribution and abundance of I- and II-group gadoids were studied in February - March, and 0-group gadoids and young sandeel in June - July. In July - August two research vessels did a combined acoustic and trawl survey, primarily to estimate the absolute abundance of 0-group Norway pout and haddock. The influx of 0-group blue whiting to the Northern North Sea was investigated in November - December. Saithe were tagged in June along the Norwegian coast.

| SPECIES<br>AREA | Season | RESEARCH VESSEL  |               |                  |               | MARKET |                  |               |                  |               |
|-----------------|--------|------------------|---------------|------------------|---------------|--------|------------------|---------------|------------------|---------------|
|                 |        | Aged             |               | Measured         |               | Tagged | Aged             |               | Measured         |               |
|                 |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |
| Cod             |        |                  |               |                  |               |        |                  |               |                  |               |
| I               | 1      | 25               | 2061          | 54               | 2690          | 600    | 23               | 2273          | 55               | 14296         |
|                 | 2      | 1                | 74            | -                | -             |        |                  |               |                  |               |
|                 | 3      | 4                | 338           | 35               | 1289          |        |                  |               |                  |               |
|                 | 4      | 1                | 42            |                  |               |        |                  |               |                  |               |
| II A            | 1      | 4                | 341           | 16               | 724           | 2500   | 11               | 926           | 14               | 4291          |
|                 | 2      | 6                | 542           | 24               | 1646          |        |                  |               |                  |               |
|                 | 3      | 10               | 620           | 46               | 1315          |        |                  |               |                  |               |
|                 | 4      | 6                | 547           | 23               | 292           |        |                  |               |                  |               |
| II B            | 2      |                  |               | 3                | 9             |        |                  |               | 6                | 392           |
|                 | 3      |                  |               | 25               | 1476          |        |                  |               |                  |               |
|                 | 4      | 9                | 493           | 21               | 407           |        |                  |               |                  |               |
| IV A            | 1      | 1                | 29            | 15               | 56            |        |                  |               | 46               | 215           |
|                 | 2      |                  |               | 11               | 81            |        |                  |               | 85               | 234           |
|                 | 3      | 1                | 52            |                  |               |        |                  |               | 29               | 34            |
|                 | 4      |                  |               |                  |               |        |                  |               | 11               | 14            |
| IV B            | 1      | 1                | 51            | 16               | 64            |        |                  |               |                  |               |

| SPECIES<br>AREA | Season | RESEARCH VESSEL  |               |                  |               | MARKET |                  |               |                  |               |
|-----------------|--------|------------------|---------------|------------------|---------------|--------|------------------|---------------|------------------|---------------|
|                 |        | Aged             |               | Measured         |               | Tagged | Aged             |               | Measured         |               |
|                 |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |
| <u>Haddock</u>  |        |                  |               |                  |               |        |                  |               |                  |               |
| I               | 1      | 11               | 751           | 33               | 2203          | 200    | 8                | 529           | 16               | 1394          |
|                 | 2      |                  |               | 2                | 97            |        |                  |               |                  |               |
|                 | 3      | 3                | 224           | 25               | 565           |        |                  |               |                  |               |
|                 | 4      |                  |               | 1                | 115           |        |                  |               |                  |               |
| II A            | 1      | 1                | 49            | 8                | 701           | 325    |                  |               | 5                | 28            |
|                 | 2      | 2                | 240           | 12               | 572           |        |                  |               | 8                | 227           |
|                 | 3      | 5                | 180           | 35               | 591           |        |                  |               | 2                | 10            |
|                 | 4      |                  |               | 11               | 207           |        |                  |               | 11               | 2361          |
| II B            | 3      |                  |               | 24               | 312           |        |                  |               |                  | 193           |
|                 | 4      | 2                | 41            | 9                | 91            |        |                  |               |                  |               |
| IV A            | 1      | 9                | 443           | 24               | 2331          |        |                  |               | 59               | 1220          |
|                 | 2      |                  |               | 21               | 475           |        |                  |               | 91               | 673           |
|                 | 3      |                  |               |                  |               |        |                  |               | 60               | 380           |
|                 | 4      |                  |               | 15               | 2184          |        |                  |               | 36               | 392           |
| IV B            | 1      |                  |               | 2                | 2             |        |                  |               |                  |               |

| SPECIES<br>AREA              | Season | RESEARCH VESSEL  |               |                  |               | MARKET |                  |               |                  |               |
|------------------------------|--------|------------------|---------------|------------------|---------------|--------|------------------|---------------|------------------|---------------|
|                              |        | Aged             |               | Measured         |               | Tagged | Aged             |               | Measured         |               |
|                              |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |
| <u>Saithe</u>                |        |                  |               |                  |               |        |                  |               |                  |               |
| I                            | 1      |                  |               | 1                | 1             |        |                  |               |                  |               |
|                              | 2      |                  |               |                  |               |        | 3                | 352           | 7                | 1334          |
|                              | 3      | 2                | 190           | 2                | 1079          | 1000   |                  |               | 9                | 823           |
| II A                         | 1      |                  |               |                  |               |        | 10               | 947           | 13               | 2718          |
|                              | 2      | 3                | 309           | 7                | 849           | 1800   | 1                | 95            | 13               | 1989          |
|                              | 3      | 2                | 199           | 10               | 1125          | 1000   | 3                | 346           | 29               | 4790          |
|                              | 4      | 1                | 100           | 1                | 3             |        |                  |               | 23               | 2828          |
| II B                         | 3      |                  |               | 1                | 1             |        |                  |               |                  |               |
| IV A                         | 1      |                  |               | 5                | 65            |        |                  |               | 28               | 53            |
|                              | 2      | 3                | 300           | 15               | 1676          | 1800   |                  |               | 49               | 922           |
|                              | 3      |                  |               |                  |               |        |                  |               | 67               | 564           |
|                              | 4      | 2                | 200           | 2                | 70            | 1500   |                  |               | 39               | 2337          |
| <u>Greenland<br/>Halibut</u> |        |                  |               |                  |               |        |                  |               |                  |               |
| I                            | 1      |                  |               | 4                | 12            |        |                  |               |                  |               |
|                              | 2      |                  |               |                  |               |        | 4                | 368           |                  |               |
|                              | 3      |                  |               | 1                | 2             |        |                  |               |                  |               |
| II A                         | 2      |                  |               | 2                | 33            |        |                  |               |                  |               |
|                              | 3      |                  |               | 1                | 1             |        |                  |               |                  |               |
|                              | 4      |                  |               |                  |               |        | 7                | 308           | 1                | 187           |
| II B                         | 2      |                  |               |                  | 45            |        |                  |               |                  |               |
|                              | 3      |                  |               | 38               | 843           |        |                  |               |                  |               |
|                              | 4      | 11               | 115           | 4                | 248           |        | 1                | 490           |                  |               |

[illegible]

| SPECIES<br>AREA    | Season | RESEARCH VESSEL  |               |                  |               | MARKET |                  |               |                  |               |
|--------------------|--------|------------------|---------------|------------------|---------------|--------|------------------|---------------|------------------|---------------|
|                    |        | Aged             |               | Measured         |               | Tagged | Aged             |               | Measured         |               |
|                    |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |
| <u>Whiting</u>     |        |                  |               |                  |               |        |                  |               |                  |               |
| I                  | 1      |                  |               | 1                | 1             |        |                  |               |                  |               |
| II A               | 1      |                  |               | 1                | 1             |        |                  |               |                  |               |
|                    | 2      |                  |               | 3                | 16            |        |                  |               |                  |               |
|                    | 4      |                  |               | 4                | 11            |        |                  |               |                  |               |
| IV A               | 1      | 5                | 459           | 19               | 771           |        |                  |               | 73               | 1081          |
|                    | 2      |                  |               | 4                | 10            |        |                  |               | 65               | 974           |
|                    | 3      |                  |               |                  |               |        |                  |               | 13               | 71            |
|                    | 4      |                  |               | 6                | 490           |        |                  |               | 35               | 145           |
| IV B               | 1      | 2                | 51            | 24               | 1812          |        |                  |               |                  |               |
|                    | 3      |                  |               | 1                | 48            |        |                  |               |                  |               |
| <u>Norway pout</u> |        |                  |               |                  |               |        |                  |               |                  |               |
| I                  | 1      |                  |               | 8                | 167           |        |                  |               |                  |               |
|                    | 2      |                  |               | 1                | 60            |        |                  |               |                  |               |
|                    | 3      |                  |               | 1                | 1             |        |                  |               |                  |               |
|                    | 4      |                  |               | 1                | 70            |        |                  |               |                  |               |
| II A               | 1      |                  |               | 4                | 133           |        |                  |               | 1                | 55            |
|                    | 2      |                  |               | 12               | 320           |        |                  |               |                  |               |
|                    | 3      |                  |               | 2                | 106           |        |                  |               |                  |               |
|                    | 4      |                  |               | 5                | 201           |        |                  |               |                  |               |
| II B               | 4      |                  |               | 1                | 2             |        |                  |               |                  |               |
| IV A               | 1      | 8                | 222           | 20               | 2306          |        | 3                | 100           | 45               | 4533          |
|                    | 2      |                  |               | 20               | 932           |        | 2                | 75            | 41               | 3849          |
|                    | 3      |                  |               |                  |               |        | 1                | 25            | 26               | 2504          |
|                    | 4      | 3                | 159           | 15               | 2160          |        | 2                | 64            | 16               | 1641          |

| SPECIES<br>AREA | Season | RESEARCH VESSEL  |               |                  |               | MARKET |                  |               |                  |               |
|-----------------|--------|------------------|---------------|------------------|---------------|--------|------------------|---------------|------------------|---------------|
|                 |        | Aged             |               | Measured         |               | Tagged | Aged             |               | Measured         |               |
|                 |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |
| Blue whiting    |        |                  |               |                  |               |        |                  |               |                  |               |
| I               | 1      |                  |               | 3                | 12            |        |                  |               |                  |               |
|                 | 3      |                  |               | 2                | 9             |        |                  |               |                  |               |
| II A            | 1      |                  |               | 1                | 1             |        |                  |               | 6                | 354           |
|                 | 2      |                  |               | 11               | 115           |        |                  |               | 5                | 254           |
|                 | 3      |                  |               | 11               | 77            |        |                  |               | 5                | 145           |
|                 | 4      |                  |               | 1                | 1             |        |                  |               | 1                | 50            |
| II B            | 2      |                  |               | 1                | 44            |        |                  |               |                  |               |
|                 | 3      |                  |               | 5                | 156           |        |                  |               |                  |               |
|                 | 4      |                  |               | 21               | 1253          |        |                  |               |                  |               |
| IV A            | 1      |                  |               | 2                | 146           |        |                  |               | 22               | 1272          |
|                 | 2      |                  |               |                  |               |        |                  |               | 24               | 1878          |
|                 | 3      |                  |               |                  |               |        |                  |               | 16               | 1144          |
|                 | 4      |                  |               | 13               | 1889          |        |                  |               | 8                | 800           |
| IV B            | 3      |                  |               |                  |               |        |                  |               | 1                | 100           |
| Silver smelt    |        |                  |               |                  |               |        |                  |               |                  |               |
| II A            | 1      |                  |               |                  |               |        |                  |               | 5                | 257           |
|                 | 2      |                  |               | 6                | 153           |        |                  |               | 5                | 250           |
|                 | 3      |                  |               |                  |               |        |                  |               | 2                | 100           |
|                 | 4      |                  |               |                  |               |        |                  |               | 1                | 50            |
| IV A            | 1      |                  |               | 5                | 53            |        |                  |               | 13               | 360           |
|                 | 2      |                  |               | 1                | 1             |        |                  |               | 19               | 398           |
|                 | 3      |                  |               |                  |               |        |                  |               | 6                | 65            |
|                 | 4      |                  |               | 6                | 509           |        |                  |               | 5                | 73            |

| SPECIES<br>AREA           | Season | RESEARCH VESSEL  |               |                  |               | MARKET |                  |               |                  |               |
|---------------------------|--------|------------------|---------------|------------------|---------------|--------|------------------|---------------|------------------|---------------|
|                           |        | Aged             |               | Measured         |               | Tagged | Aged             |               | Measured         |               |
|                           |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |
| <u>Sandeel</u>            |        |                  |               |                  |               |        |                  |               |                  |               |
| I                         | 3      |                  |               | 19               | 444           |        |                  |               |                  |               |
| II A                      | 3      |                  |               | 1                | 4             |        |                  |               |                  |               |
| II B                      | 3      |                  |               | 2                | 2             |        |                  |               |                  |               |
| IV A                      | 2      |                  |               | 22               | 815           |        |                  |               |                  |               |
|                           | 4      |                  |               |                  |               |        |                  |               | 2                | 200           |
| IV B                      | 2      |                  |               |                  |               |        |                  |               | 6                | 600           |
|                           | 3      |                  |               | 1                | 18            |        |                  |               | 1                | 100           |
| <u>Long rough<br/>dab</u> |        |                  |               |                  |               |        |                  |               |                  |               |
| I                         | 1      |                  |               | 42               | 2029          |        |                  |               |                  |               |
|                           | 2      |                  |               | 2                | 100           |        |                  |               |                  |               |
|                           | 3      |                  |               | 17               | 408           |        |                  |               |                  |               |
|                           | 4      |                  |               | 2                | 41            |        |                  |               |                  |               |
| II A                      | 1      |                  |               | 2                | 110           |        |                  |               |                  |               |
|                           | 2      |                  |               | 10               | 542           |        |                  |               |                  |               |
|                           | 3      |                  |               | 10               | 84            |        |                  |               |                  |               |
|                           | 4      |                  |               | 2                | 212           |        |                  |               |                  |               |

| SPECIES<br>AREA | Season | RESEARCH VESSEL  |               |                  |               | MARKET |                  |               |                  |               |
|-----------------|--------|------------------|---------------|------------------|---------------|--------|------------------|---------------|------------------|---------------|
|                 |        | Aged             |               | Measured         |               | Tagged | Aged             |               | Measured         |               |
|                 |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |        | No.of<br>samples | No.of<br>fish | No.of<br>samples | No.of<br>fish |
| II B            | 2      |                  |               | 2                | 118           |        |                  |               |                  |               |
|                 | 3      |                  |               | 29               | 602           |        |                  |               |                  |               |
|                 | 4      |                  |               | 29               | 2989          |        |                  |               |                  |               |
| IV A            | 1      |                  |               | 21               | 692           |        |                  |               | 1                | 43            |
|                 | 2      |                  |               | 1                | 1             |        |                  |               |                  |               |
|                 | 4      |                  |               | 2                | 110           |        |                  |               |                  |               |
| IV B            | 1      |                  |               | 7                | 140           |        |                  |               |                  |               |
| <u>Redfish</u>  |        |                  |               |                  |               |        |                  |               |                  |               |
| I               | 1      |                  |               | 43               | 1899          |        |                  |               |                  |               |
|                 | 3      |                  |               | 26               | 1441          |        |                  |               |                  |               |
|                 | 4      |                  |               | 1                | 54            |        |                  |               |                  |               |
| II A            | 1      |                  |               | 8                | 513           |        |                  |               |                  |               |
|                 | 2      |                  |               | 27               | 1632          |        |                  |               |                  |               |
|                 | 3      |                  |               | 54               | 4760          |        |                  |               |                  |               |
|                 | 4      |                  |               | 7                | 265           |        |                  |               | 1                | 79            |
| II B            | 2      |                  |               | 3                | 186           |        |                  |               |                  |               |
|                 | 3      |                  |               | 33               | 1961          |        |                  |               |                  |               |
|                 | 4      |                  |               | 27               | 2434          |        |                  |               |                  |               |
| IV A            | 4      |                  |               | 1                | 86            |        |                  |               | 1                | 7             |

Poland

(W. Cieglewicz + A. Paciorkowski)

Sampling Data for 1978

| Species and Area     | Season | No. of Sampling |        | No. of Fish |      |
|----------------------|--------|-----------------|--------|-------------|------|
|                      |        | Research Vessel | Market | Measured    | Aged |
| <u>COD</u> IIa       | 2      | -               | 4      | 3 204       | 401  |
| IIa                  | 3      | -               | 3      | 1 397       | 302  |
| IIb                  | 2      | -               | 3      | 2 212       | 300  |
| <u>GREENLAND</u> IIa | 2      | -               | 2      | 1 943       | 100  |
| <u>HALIBUT</u> IIb   | 2      | -               | 6      | 5 850       | 400  |

Portugal

(M. Lima Dias)

Sampling Data, 1978 on Portuguese coast (Fishing Ports)

HAKE (Merluccius merluccius L.)

| Area  | Season | Number of Samples | No. of Fish Measured |
|-------|--------|-------------------|----------------------|
| IX    | I      | 50                | 4 083                |
|       | II     | 38                | 2 256                |
|       | III    | 36                | 2 231                |
|       | IV     | 37                | 1 646                |
| Total |        | 161               | 10 216               |

Spain

(R. Robles)

1. Travaux réalisés par l'Institut espagnol d'Océanographie (IEO)

a) Activités en mer

Le Laboratoire des Iles des Canaries (Ténérife) a poursuivi ses travaux sur les chalutiers de la flottille commerciale pour étudier les écarts des poissons dans la pêcherie du Ouest Afrique (21°30' à 26°00' N), en faisant deux campagnes dans lesquelles on avait réalisé des mensurations sur différentes espèces (Merluccius senegalensis, Trachurus trachurus, Boops boops, Pagellus coupei, Sepia officinalis, S. orbingyana, Loligo vulgaris et Octopus vulgaris).

Les laboratoires de la côte nord-ouest de l'Espagne ont effectué quelques sorties à bord des chalutiers pêchant sur le plateau continental du nord-ouest espagnol.

b) Travaux à terre

i) Merlu

On a eu quelques difficultés avec la récolte des données sur la composition des captures et l'effort selon les différentes zones de pêche, mais malgré tout, on a obtenu des données approximatives.

En relation avec le stock du plateau continental du nord-ouest de l'Espagne on a publié un travail sur "La pêcherie demersale galicienne; stratégies de pêche pour sa régulation rationnelle en base au merlu", qui étudie les interrelations entre les différents engins de pêche.

ii) Autres espèces

Le merlan bleu (Micromesistius poutassou) le cinchard (Trachurus trachurus) et les cardines (Lepidorhombus spp.) ont également été étudiés dans un certain degré, surtout le merlan bleu, étant donné qu'elles sont des espèces les plus abondantes dans la côte galicienne, apart du merlu.

2. Travaux réalisés par d'autres organismes

L'Institut pour les Recherches sur les Pêcheries a complété ses études sur la maturité sexuelle, la ponte et la fécondité des cardines.

On a continué les observations concernant la nourriture et la croissance de quelques espèces de Triglidés de la côte galicienne. Egalement, on a effectué des observations sur la biométrie, sexe, maturité sexuelle, nourriture et croissance de la dorade (Pagellus bogaravo), maquereaux (Scomber scombrus) et la merlu (Merluccius merluccius) du plateau continental galicien.

En collaboration avec l'Institut espagnol d'Océanographie on a déroulé divers travaux, dans la mer et à terre, tenant pour but une étude plus complète concernant les ressources du merlu dans les eaux du nord-ouest espagnol.

Pendant l'année 1978 on a effectué une étude statistique des relations et dépendances entre différentes espèces de poissons et entre eux-mêmes, et quelques variables physico-chimiques du milieu dans la pêcherie de la Galicie.

Avec les données qui ont été obtenues au cours des campagnes des années précédentes on a conclu le travail sur la distribution et abondance des espèces démersaux de la pêche galicienne.

### 3. Travaux envisagés pour 1979

Revision des données sur la pêche galicienne et mise en contact avec les collègues portugais pour une étude conjointe des stocks des Divisions VIIIc ouest et IXa.

Réalisation, si possible, de trois campagnes, dont l'un sera consacré aux travaux de sélectivité, ayant pour but également l'étude multi-disciplinaire du plateau continental de la Galicie.

### 4. Echantillonnage des espèces plus importantes

| Région       | Saison     | No. d'échantillons |        | No. de poissons mesuré |        |
|--------------|------------|--------------------|--------|------------------------|--------|
|              |            | Bateau commercial  | Marché | Bateau commercial      | Marché |
| <u>MERLU</u> |            |                    |        |                        |        |
| VIIg,h,      | 1er trim.  | -                  | 1      | -                      | 647    |
| j,k          | 2ème trim. | -                  | 4      | -                      | 1 051  |
| VIIIa,b      | 1er trim.  | -                  | 1      | -                      | 381    |
|              | 2ème trim. | -                  | 3      | -                      | 1 959  |
|              | 3ème trim. | -                  | 5      | -                      | 1 471  |
|              | 4ème trim. | -                  | 4      | -                      | 554    |
| VIIIc + IXa  | 1er trim.  | 2                  | 30     | 618                    | 8 274  |
|              | 2ème trim. | 2                  | 31     | 207                    | 4 009  |
|              | 3ème trim. | 2                  | 36     | 154                    | 3 014  |
|              | 4ème trim. | 3                  | 28     | 1 353                  | 3 361  |

| Région                         | Trimestre | Echantillons |       | No. de Poissons mesuré |
|--------------------------------|-----------|--------------|-------|------------------------|
|                                |           | Mer          | Terre |                        |
| <u>Sepia officinalis</u>       |           |              |       |                        |
| 23°00'-26°00'                  | I         | 23           | -     | -                      |
|                                | III       | 9            | -     | 191                    |
| <u>Pagellus coupi</u>          |           |              |       |                        |
| 23°00'-26°00'                  | I         | 29           | -     | 331                    |
|                                | III       | 20           | -     | 225                    |
| <u>Merluccius senegalensis</u> |           |              |       |                        |
| 23°00'-26°00'                  | III       | 6            | -     | 240                    |
| <u>Trachurus trachurus</u>     |           |              |       |                        |
| 23°00'-26°00'                  | I         | 23           | -     | 223                    |
|                                | III       | 25           | -     | 504                    |
| <u>Boops boops</u>             |           |              |       |                        |
| 23°00'-26°00'                  | I         | 20           | -     | 137                    |
|                                | III       | 2            | -     | 3                      |

| Région                                   | Trimestre | Echantillons |        | No. de Poissons<br>mesuré |
|------------------------------------------|-----------|--------------|--------|---------------------------|
|                                          |           | Mer          | Terre  |                           |
| <u>Loligo vulgaris</u><br>23°00'-26°00'  | I<br>III  | 3<br>8       | -<br>- | 4<br>260                  |
| <u>Octopus vulgaris</u><br>23°00'-26°00' | I<br>III  | 39<br>63     | -<br>- | 676<br>1 460              |
| <u>Sepia orbingyana</u><br>23°00'-26°00' | III       | 8            | -      | 114                       |

Sweden

(O. Hagström + B. Sjöstrand)

SAMPLING DATA WHITING 1978

| AREA      | SEASON | TYPE OF FISH | NO OF SAMPLE       |        | NO OF FISH<br>MEASURED | AGED |
|-----------|--------|--------------|--------------------|--------|------------------------|------|
|           |        |              | RESEARCH<br>VESSEL | MARKET |                        |      |
| KATTEGATT | II     |              | 9                  |        | 1 505                  | 239  |
| SKAGERRAK | II     |              | 11                 |        | 1 698                  | 284  |
| NORTH SEA | II     |              | 3                  |        | 464                    | 198  |

SAMPLING DATA HADDOCK 1978

| AREA      | SEASON | TYPE OF FISH | NO OF SAMPLE       |        | NO OF FISH<br>MEASURED | AGED |
|-----------|--------|--------------|--------------------|--------|------------------------|------|
|           |        |              | RESEARCH<br>VESSEL | MARKET |                        |      |
| KATTEGATT | II     |              | 9                  |        | 63                     | 55   |
| SKAGERRAK | II     |              | 11                 |        | 297                    | 415  |
| NORTH SEA | II     |              | 3                  |        | 367                    | 173  |

SAMPLING DATA PLAICE 1978

| AREA      | SEASON | TYPE OF FISH | NO OF SAMPLE       |        | NO OF FISH<br>MEASURED | AGED |
|-----------|--------|--------------|--------------------|--------|------------------------|------|
|           |        |              | RESEARCH<br>VESSEL | MARKET |                        |      |
| KATTEGATT | I      |              |                    | 1      | 93                     | -    |
| "         | III    |              |                    | 2      | 847                    | 235  |
| "         | IV     |              |                    | 1      | 272                    | 109  |
| "         | V      |              |                    | 2      | 316                    | 73   |
| "         | VI     |              |                    | 2      | 422                    | 87   |

SAMPLING DATA COD 1978

| AREA      | SEASON | TYPE OF FISH | NO OF SAMPLE       |        | NO OF FISH<br>MEASURED | AGED |
|-----------|--------|--------------|--------------------|--------|------------------------|------|
|           |        |              | RESEARCH<br>VESSEL | MARKET |                        |      |
| KATTEGATT | I      |              |                    | 4      | 2 008                  | 197  |
| KATTEGATT | II     | Im.          | 9                  |        | 1 827                  | 501  |
| SKAGERRAK | II     | Im.          | 11                 |        | 224                    | 275  |
| NORTH SEA | II     | Im.          | 3                  |        | 303                    | 197  |
| KATTEGATT | III    |              |                    | 4      | 2 007                  | 425  |
| KATTEGATT | IV     |              |                    | 4      | 1 685                  | 283  |
| KATTEGATT | V      |              |                    | 3      | 847                    | 100  |
| KATTEGATT | VI     |              |                    | 4      | 1 351                  | 214  |

United Kingdom

1. Sampling

1. England and Wales

(A.C. Burd)

COD

| Area                        | Research vessels | No. of samples | No. fish measured | Aged  |
|-----------------------------|------------------|----------------|-------------------|-------|
| Arctic I, IIa, IIb          |                  | 109            | 17 303            | 1 361 |
| Faroe Vb + b <sub>2</sub>   |                  | 16             | 1 940             | 384   |
| North Sea IVa+b+c, offshore | +                | 915            | 131 088           | 7 450 |
| W. Scotland VIa             | +                | 74             | 11 870            | 1 104 |
| Rockall VIb                 |                  | 15             | 1 691             | 252   |
| Irish Sea VIIa, offshore    | +                | 110            | 15 229            | 2 181 |
| Bristol Channel VIIf        | +                | 1              | 172               | 62    |
| SE Ireland VIIg             | +                | 3              | 375               | 67    |
| E. English Channel VIId     | +                | 58             | 4 295             | 110   |
| W. " " VIIe                 |                  | 13             | 682               | -     |
| Newfoundland                |                  | -              | -                 | 37    |
| Labrador                    |                  | -              | -                 | 68    |
| <u>Freezers</u>             |                  |                |                   |       |
| Arctic                      |                  | 27             | 12 793            |       |
| Newfoundland                |                  | 2              | 603               |       |
| North Sea                   |                  | 1              | 40                |       |

|                               | Samples | Fish measured | Otoliths |
|-------------------------------|---------|---------------|----------|
| North Sea, all ports offshore | 445     | 66 247        | 3 979    |
| NE coast, inshore             | 403     | 54 838        | 2 875    |
| East coast, inshore           | 67      | 10 003        | 596      |
|                               | 915     | 131 088       | 7 450    |
| Irish Sea, offshore           | 25      | 4 329         | 546      |
| " " inshore                   | 85      | 10 900        | 1 635    |
|                               | 110     | 15 229        | 2 181    |

SAITHE

| Area                         | Research vessels | No. of samples | No. fish measured | Aged |
|------------------------------|------------------|----------------|-------------------|------|
| Arctic I, IIa, IIb           |                  | 24             | 2 668             | 390  |
| Faroe Vb + b <sub>2</sub>    |                  | 12             | 950               | 204  |
| North Sea IVa +b+c, offshore |                  | 64             | 6 596             | 860  |
| W. Scotland VIa              |                  | 71             | 7 584             | 638  |
| Rockall VIb                  |                  | 1              | 92                | -    |
| <u>No freezers</u>           |                  |                |                   |      |

PLAICE

| Area                         | Research vessels | No. of samples | No. fish measured | Aged  |
|------------------------------|------------------|----------------|-------------------|-------|
| North Sea IVa+b+c, offshore. | +                | 331            | 57 389            | 4 047 |
| Irish Sea VIIa, offshore     | +                | 131            | 24 527            | 1 839 |
| Bristol Channel VIIIf        | +                | 14             | 3 257             | 232   |
| S.E. Ireland VIIg            | +                | 8              | 1 537             | 63    |
| W. Scotland VIa              |                  | 1              | 288               | -     |
| E. English Channel VIIId     | +                | 67             | 5 264             | 452   |
| W. " " VIIIf                 |                  | 145            | 13 865            | 1 706 |

|                     | Samples | Fish measured | Otoliths |
|---------------------|---------|---------------|----------|
| North Sea, offshore | 294     | 53 536        | 3 816    |
| East coast, inshore | 37      | 3 853         | 231      |
|                     | 331     | 57 389        | 4 047    |
| Irish Sea, offshore | 21      | 4 794         | 402      |
| " " inshore         | 110     | 19 733        | 1 437    |
|                     | 131     | 24 527        | 1 839    |

HADDOCK

| Area                        | Research vessels | No. of samples | No. fish measured | Aged  |
|-----------------------------|------------------|----------------|-------------------|-------|
| Arctic I, IIa, IIb          |                  | 81             | 12 670            | 901   |
| Faroe Vb + b <sub>2</sub>   |                  | 13             | 1 703             | -     |
| North Sea IVa+b+c, offshore | +                | 475            | 63 341            | 2 867 |
| W. Scotland VIa             | +                | 80             | 9 413             | 940   |
| Irish Sea VIIa, offshore    | +                | 12             | 1 018             | 60    |
| Bristol Channel VIIIf       | +                | 2              | 118               | -     |
| S.E. Ireland VIIg           | +                | 1              | 121               | -     |
| Rockall VIb                 | +                | 20             | 2 623             | 177   |

Freezers

| Arctic                        | 1       | 52               | -        |
|-------------------------------|---------|------------------|----------|
|                               | Samples | Fish<br>measured | Otoliths |
| North Sea, all ports offshore | 234     | 36 787           | 1 812    |
| NE coast, inshore             | 240     | 26 449           | 1 042    |
| East coast, inshore           | 1       | 105              | 13       |
|                               | 475     | 63 341           | 2 867    |
| Irish Sea, offshore           | 1       | 50               | 22       |
| " " inshore                   | 11      | 968              | 38       |
|                               | 12      | 11 018           | 60       |

SOLE

| Area                        | Research vessels | No. of samples | No. fish measured | Aged |
|-----------------------------|------------------|----------------|-------------------|------|
| North Sea IVa+b+c, offshore | +                | 55             | 7 697             | 646  |
| Irish Sea VIIa, offshore    | +                | 78             | 14 061            | 478  |
| Bristol Channel VIIIf       | +                | 4              | 923               | 54   |
| S.E. Ireland VIIg           | +                | 5              | 1 146             | 54   |
| E. English Channel VIId     | +                | 102            | 10 426            | 406  |
| W. " " VIIe                 |                  | 132            | 14 027            | 885  |

|                            | Samples | Fish measured | Otoliths |
|----------------------------|---------|---------------|----------|
| North Sea sole all inshore |         |               |          |
| Irish Sea, offshore        | 11      | 2 375         | -        |
| " " inshore                | 67      | 11 686        | 478      |
|                            | 78      | 14 061        | 478      |

HAKE

| Area                        | Research vessels | No. of samples | No. fish measured | Aged |
|-----------------------------|------------------|----------------|-------------------|------|
| North Sea IVa+b+c, offshore |                  | 4              | 516               | -    |
| Irish Sea VIIa, offshore    |                  | 37             | 6 508             | -    |
| Bristol Channel VIIIf       |                  | -              | -                 | -    |
| S.E. Ireland VIIe           |                  | 5              | 968               | -    |
| W. Scotland VIa             |                  | 38             | 6 509             | -    |
| W. English Channel VIIe     |                  | 9              | 612               | -    |

|                             | Samples | Fish measured | Otoliths |
|-----------------------------|---------|---------------|----------|
| North Sea hake all offshore |         |               |          |
| Irish Sea, offshore         | 5       | 1 030         | -        |
| " " inshore                 | 32      | 5 478         | -        |
|                             | 37      | 6 508         | -        |

WHITING

| Area                        | Research vessels | No. of samples | No. fish measured | Aged  |
|-----------------------------|------------------|----------------|-------------------|-------|
| North Sea IVa+b+c, offshore | +                | 399            | 33 101            | 2 067 |
| Irish Sea VIIa, offshore    | +                | 117            | 13 452            | 1 200 |
| Bristol Channel VIIIf       | +                | 8              | 821               | 130   |
| S.E. Ireland VIIg           | +                | 5              | 623               | 76    |
| E. English Channel VIId     |                  | 34             | 2 445             | -     |
| W. " " VIIe                 |                  | 101            | 10 325            | 616   |

|                     | Samples | Fish measured | Otoliths |
|---------------------|---------|---------------|----------|
| North Sea, offshore | 98      | 8 543         | 1 222    |
| NE coast, inshore   | 295     | 24 014        | 845      |
| E. coast, inshore   | 6       | 544           | -        |
|                     | 399     | 33 101        | 2 067    |
| Irish Sea, offshore | 18      | 1 998         | 260      |
| Irish Sea, inshore  | 99      | 11 454        | 940      |
|                     | 117     | 13 452        | 1 200    |

TURBOT

NIL all sources  
Research vessels - W & NW area

SPURDOG

| Area                        | Research vessels | No. of samples | No. fish measured | Aged |
|-----------------------------|------------------|----------------|-------------------|------|
| North Sea IVa+b+c, offshore |                  | 105            | 8 079             | -    |
| W. Scotland VIa             |                  | 47             | 4 928             | -    |

|                     | Samples | Fish measured |
|---------------------|---------|---------------|
| North Sea, offshore | 99      | 7 557         |
| East coast, inshore | 6       | 522           |
|                     | 105     | 8 079         |

SKATES AND RAYS

| Area                        | Research<br>vessels | No. of<br>samples | No. fish<br>measured | Aged |
|-----------------------------|---------------------|-------------------|----------------------|------|
| North Sea IVa+b+c, offshore |                     | 4                 | 374                  | -    |
| W. Scotland VIa             |                     | 14                | 1 150                | -    |
| Irish Sea VIIa              |                     | 107               | 12 459               | -    |
| Bristol Channel VIIIf       |                     | 6                 | 951                  | -    |
| S.E. Ireland VIIIg          |                     | 4                 | 621                  | -    |

|                                       | Samples | Fish<br>measured |
|---------------------------------------|---------|------------------|
| North Sea skates and rays all inshore |         |                  |
| Irish Sea, offshore                   | 28      | 4 341            |
| " " inshore                           | 79      | 8 118            |
|                                       | 107     | 12 459           |

BLUE LING

| Area             | Research<br>vessels | No. of<br>samples | No. fish<br>measured | Aged |
|------------------|---------------------|-------------------|----------------------|------|
| W. Scotland 106A |                     | 2                 | 220                  | 102  |

LEMON SOLE

| Area                    | Research<br>vessels | No. of<br>samples | No. fish<br>measured | Aged |
|-------------------------|---------------------|-------------------|----------------------|------|
| E. English Channel VIId |                     | 1                 | 65                   | -    |
| W. " " VIIe             |                     | 124               | 12 022               | 461  |
| North Sea IVa           | +                   |                   |                      |      |
| W & NW                  | +                   |                   |                      |      |

BRILL

|        | Research<br>vessels |
|--------|---------------------|
| W & NW | +                   |

Release of English tagged fish in ICES areas during 1978

| Species  | Region |       |       |      |      |      |      | Total |
|----------|--------|-------|-------|------|------|------|------|-------|
|          | 104A   | 104B  | 104C  | 107D | 107E | 107A | 106A |       |
| Cod      | 310    | 289   | 2 056 | 513  |      | 34   | 332  | 3 534 |
| Plaice   |        | 523   | 525   |      |      |      |      | 1 048 |
| Sole     |        | 462   | 694   |      |      | 588  |      | 1 744 |
| Whiting  |        |       | 355   |      |      |      |      | 355   |
| Haddock  | 37     |       |       |      |      |      | 7    | 44    |
| Coalfish | 35     |       |       |      |      |      | 8    | 43    |
| Turbot   |        |       | 3     |      |      | 33   |      | 36    |
| Brill    |        |       | 16    |      |      |      |      | 16    |
| TOTAL    | 382    | 1 274 | 3 649 | 513  | -    | 655  | 347  | 6 820 |

2. Research vessel surveys

| <u>Area</u>      | <u>Month</u>                   | <u>Objectives</u>                      |
|------------------|--------------------------------|----------------------------------------|
| North Sea 104    | February-March                 | Cod tagging                            |
| " "              | June                           | " "                                    |
| " "              | March                          | Young fish survey                      |
| " "              | June                           | International 0-group gadoids survey   |
| " "              | February                       | Industrial stocks                      |
| " "              | September-October              | " "                                    |
| " "              | April, May, June and September | Inshore stocks - 0 and I group surveys |
| " "              | August-September               | Groundfish surveys                     |
| W. Scotland 106A | October                        | Deepwater stocks                       |
| Irish Sea 107A   | September-October              | Groundfish survey                      |

## 2. Scotland

(R. Jones)

### 1. Research vessel activities

FRV "Explorer" and FRV "Clupea" participated in the 1978 International Young Herring Survey in February. "Explorer" also carried out surveys of pre-recruit cod haddock and whiting at Faroe (May-June), in the North Sea (October-November) and on the west coast of Scotland (November-December).

FRV "Explorer" participated in an internationally coordinated North Sea survey of 0-group gadoids during the pelagic phase of their life history in June and July while FRV "Scotia" carried out a similar survey in November.

FRV "Mara" carried out a pre-recruit plaice survey off the east coast of Scotland during November and December.

Numbers of fish measured and aged are shown in Table 2.

### 2. Routine monitoring of demersal fish landings

Landings of cod, haddock, whiting, saithe, plaice, lemon sole and megrim were sampled to obtain size and length data for all areas fished by Scottish trawlers, seiners, light trawlers and Nephrops trawlers.

Numbers of fish measured and aged are shown in Table 2.

### 3. Measurement of discarding rates

Twenty nine trips were made on Scottish commercial fishing vessels to determine the numbers of haddock and whiting discarded at each age. Some length frequency data were also collected for other species.

### 4. Tagging Experiments

During the course of the year four commercial fishing vessels were chartered to carry out tagging operations on the west coast of Scotland. In addition, FRV "Mara" carried out a tagging experiment in the Moray Firth and the commercial boat M/B "Replenish" tagged lemon sole in Shetland waters.

Further details are provided in Table 1.

### 5. Sandeel and Norway pout sampling

More sandeel samples were analysed in 1978 than in previous years. From 62 samples 15 890 fish were measured, of which 801 were also weighed and aged. Fewer Norway pout samples were available, due to the closure of the Fraserburgh fishery and a decline in landings at Lerwick and Stornoway. In total, 17 604 fish were measured and 1 090 aged.

### 6. Field Studies in Loch Torridon

Experiments to examine the growth and feeding of juvenile cod in a sea loch have continued, and have been supplemented by laboratory experiments on the maintenance requirements of the young fish. Tracking experiments by means of acoustic tags have shown that the activity patterns of young fish are different at different seasons, the fish showing a diurnal cycle in the summer, and a nocturnal cycle in the winter.

Table 1 Numbers of fish tagged in 1978

| Boat      | Month     | Area        | Numbers of fish tagged |         |         |        |        |      |
|-----------|-----------|-------------|------------------------|---------|---------|--------|--------|------|
|           |           |             | Cod                    | Haddock | Whiting | Plaice | L Sole | Hake |
| Mara      | February  | Moray Firth | -                      | -       | -       | 1588   | -      | -    |
| Steadfast | March     | I Hebrides  | 194                    | -       | 64      | -      | 27     | -    |
| Replenish | May       | Shetland    | -                      | -       | -       | -      | 1671   | -    |
| Scotia    | August    | I Hebrides  | 5                      | 458     | 33      | 1918   | 483    | -    |
| Faithful  | August    | Clyde       | 21                     | 12      | 1240    | 49     | 5      | 12   |
| Jenmar    | September | N Ireland   | 268                    | 481     | 829     | 554    | 54     | 1    |

Table 2 Number of fish measured and aged in 1978

| Area       | Cod   |       | Haddock |       | Whiting |       | Hake |      |
|------------|-------|-------|---------|-------|---------|-------|------|------|
|            | Meas  | Aged  | Meas    | Aged  | Meas    | Aged  | Meas | Aged |
| North Sea  |       |       |         |       |         |       |      |      |
| 1)         | 44320 | 10153 | 101563  | 14814 | 111065  | 12233 | 29   | -    |
| 2)         | 3556  | 660   | 63905   | 1605  | 68071   | 2109  | 261  | -    |
| West Coast |       |       |         |       |         |       |      |      |
| 1)         | 26953 | 7515  | 56087   | 8092  | 35714   | 5055  | 1540 | -    |
| 2)         | 122   | 110   | 7920    | 784   | 19563   | 1486  | 250  | -    |
| Faroe      |       |       |         |       |         |       |      |      |
| 1)         | 2243  | -     | 3639    | 1844  | 998     | 612   | -    | -    |
| 2)         | 1899  | 978   | 9250    | 1320  | 883     | 718   | -    | -    |
| White Sea  |       |       |         |       |         |       |      |      |
| 1)         | 737   | -     | 448     | 267   | -       | -     | -    | -    |
| 2)         | -     | -     | -       | -     | -       | -     | -    | -    |

1) Market sampling data

2) Research vessel data

U.S.A.

(M.P. Sissenwine)

A more complete report on USA demersal fish research is contained in the USA Research Report to the Annual Meeting of ICNAF, June 1978.

During 1978, the status of stocks of more than twenty species or species groups exploited along the Atlantic coast of the USA north of Cape Hatteras was assessed. The demersal (at least partially demersal) fish stocks that were assessed are cod of the (1) Gulf of Maine and (2) Georges Bank - southern New England area; haddock of Georges Bank; redfish of the Gulf of Maine - Georges Bank area; silver hake of (1) the Gulf of Maine, (2) Georges Bank and (3) southern New England - mid-Atlantic area; red hake of (1) Georges Bank and (2) southern New England - mid-Atlantic area; pollock of Georges Bank - Gulf of Maine - Nova Scotia area; yellowtail flounder of (1) Georges Bank, (2) the Cape Code area (3) southern New England and (4) the mid-Atlantic area; flounder except yellowtail for the USA Atlantic coast north of Cape Hatteras; scup, weakfish, and other finfish (excluding species already considered, menhaden and large pelagics) for the USA Atlantic coast of north of Cape Hatteras. Stock assessment were based on length samples of commercial landings, research vessel trawl surveys, and age determinations of both commercial and research vessel catches. Commercial sampling, bottom trawl research survey and aging activity for 1978 is summarized in Tables 1, 2, and 3 respectively.

The United States has also continued research on the interactions between fish species. During 1978, preliminary calculations of the rate of consumption and production of Georges Bank nekton by age and species were accomplished. The results of these studies were reported at the ICES Symposium on the Biological Basis of Pelagic Fish Management held in Aberdeen, Scotland, July 1978 and the Symposium on Predator-Prey Systems in Fish Communities and their Role in Fisheries Management held in Atlantic, Georgia, July 1978. The large scale sampling program for food habits of Northwest Atlantic fishes conducted by the USA continued

in 1978. To date approximately 100 000 fish stomachs have been analyzed. Special attention was given to the analysis of the food habits of gadiform fishes. The results of this work have been submitted for publication to the US Fishery Bulletin. Special studies of Atlantic sea herring egg beds in 1978 revealed potentially important biological interactions between this pelagic species and several demersal species. Atlantic cod, haddock, yellowtail flounder, and winter flounder, were identified as herring egg predators. The entire ecosystem oriented data base is now being used in the development of a computer simulation of the Georges Bank fishery system.

During 1978, the USA initiated a survey of recreational catches of marine fish along the Atlantic coast. The survey system combines intercept sampling and telephone interviewing. Studies of the feasibility of using image analyzers to automatically age fish scales continued in 1978. Research is conducted on groundfish and industrial bottom fish in the Gulf of Mexico. Historical and current data are being examined to assess the industrial bottom fish fishery for croaker, spot, and sea trout. Also in the Gulf of Mexico, in 1978 sampling of discards in the USA shrimp fishery continued. This program will be discontinued in 1979. The finfish discards in the shrimp fishery may exceed shrimp catch by nearly an order of magnitude.

Marine research laboratories of individual states and universities also study demersal fish. During 1978, the State of Massachusetts implemented a standardized research vessel bottom trawl survey of its coastal waters. The State of Massachusetts and the State of Rhode Island are now planning such surveys. Furthermore, the State of Maine has conducted feasibility studies for tagging cod. The University of New Hampshire, has initiated a three year study of feasibility of fishing commercially for sand lance.

Table 1. USA Northwest Atlantic Commercial Landings Sampling Summary, 1978

| Species              | 1978  |
|----------------------|-------|
| Cod                  | 122   |
| Haddock              | 181   |
| Pollock              | 23    |
| Redfish              | 63    |
| Whiting              | 44    |
| Sea herring          | 500   |
| Grey Sole            | 12    |
| American dab         | 17    |
| Sand dab             | 4     |
| Mackerel             | 3     |
| Sea scallops         | 104   |
| Black back           | 48    |
| Squid sp.            | -     |
| Squid, <u>Loligo</u> | 11    |
| Squid, <u>Illex</u>  | 1     |
| Industrial           | 50    |
| Butterfish           | 17    |
| Fluke                | 48    |
| Red hake             | -     |
| Scup                 | 16    |
| Tilefish             | 1     |
| Menhaden             | 2     |
| Surf clams           | 372   |
| Ocean quahogs        | 110   |
| Yellowtail           | 58    |
| Lobster              | 3     |
| Red crab             | -     |
| Jonah crab           | -     |
| TOTAL                | 1 921 |

Table 2. Fish Age Determination During 1978.

| Species           | Number |
|-------------------|--------|
| Redfish           | 2 065  |
| Yellowtail        | 1 177  |
| Mackerel          | 349    |
| Cod               | 4 138  |
| Haddock           | 5 198  |
| Pollock           | 807    |
| Scup              | 861    |
| Silver hake       | 5 532  |
| Blackback         | 109    |
| Sea herring       | 11 193 |
| Alewives          | 987    |
| Red hake          | 5 277  |
| White hake        | 1 644  |
| Butterfish        | 57     |
| Fourspot flounder | 99     |
| Longhorn sculpin  | 204    |
| Ocean pout        | 127    |

Table 3. Bottom Trawl Survey Cruises for 1978.

| Vessel             | Date            | No. of<br>Stations | Area                               | Type of Trawl |
|--------------------|-----------------|--------------------|------------------------------------|---------------|
| ALBATROSS IV (USA) | 18 Jan - 27 Jan | 80                 | Southern New England to Cape May   | #41 Yankee    |
| ARGUS (USSR)       | 28 Jan - 2 Mar  | 89                 | Mid-Atlantic Bight to Georges Bank | Hake 815      |
| ANTON DOHRN        | 25 Feb - 23 Mar | 120                | S. New England to Gulf of Maine    | 180' Herring  |
| WIECZNO (Poland)   | 11 Mar - 20 Mar | 35                 | S. New England to Mass. Bay        | 90' Herring   |
| ALBATROSS IV (USA) | 20 Mar - 23 May | 403                | Nova Scotia to Cape Hatteras       | #41 Yankee    |
| DELAWARE II (USA)  | 25 Jul - 20 Aug | 337                | Gulf of Maine to Cape Fear         | #36 Yankee    |
| DELAWARE II (USA)  | 5 Sep - 22 Nov  | 565                | Gulf of Maine to Cape Fear         | #36 Yankee    |
| BELOGORSK (USSR)   | 10 Sep - 30 Sep | 89                 | Georges Bank, Southern New England | Hake 815      |
| ANTON DOHRN (FRG)  | 10 Oct - 18 Oct | 86                 | Georges Bank, Gulf of Maine        | 180' Herring  |

U.S.S.R.

(V.P. Ponomarenko)

Demersal Fishes (northern)

In 1978, as in previous years, data were collected in the Barents, Norwegian, North and Greenland Seas to study the abundance, age/length composition and distribution of cod, haddock, saithe, redfish, Greenland halibut and other demersal fish in the ICES area. Samples were collected by research and scouting vessels. No racial examination was made.

Further investigations were carried out to make more accurate estimates of the state of stock and abundance of the main commercial fish, both by means of traditional young fish surveys and trawl surveys in the Barent Sea. The survival conditions of fry at different stages of development were studied; ichthyoplankton was collected and analysed. Fisheries forecasts for different terms were made, the forecasting methods were improved.

Sampling data for demersal northern fish are given in the following tables.

SAMPLING DATA (COD)

| Area                         | Season | Number of samples taken by research vessels | Number of fish |      |
|------------------------------|--------|---------------------------------------------|----------------|------|
|                              |        |                                             | Measured       | Aged |
| Barents Sea subarea          | I      | 15                                          | 185671         | 4570 |
|                              | II     | 8                                           | 51296          | 2470 |
|                              | III    | 19                                          | 89111          | 5732 |
|                              | IV     | 4                                           | 17703          | 1161 |
| Bear Island-Spitsbergen area | I      | 1                                           | 4545           | 235  |
|                              | II     | 2                                           | 2358           | 264  |
|                              | III    | 1                                           | 918            | 300  |
|                              | IV     | -                                           | 1768           | -    |
| Norwegian Sea subarea        | I      | 4                                           | 6579           | 941  |
|                              | II     | 6                                           | 14151          | 1623 |
|                              | III    | -                                           | 340            | -    |
|                              | IV     | 2                                           | 1718           | 231  |

SAMPLING DATA (HADDOCK)

| Area                                 | Season | Number of<br>samples taken<br>by research<br>vessels | Number of fish |      |
|--------------------------------------|--------|------------------------------------------------------|----------------|------|
|                                      |        |                                                      | measured       | Aged |
| Barents Sea<br>sub-area              | I      | 6                                                    | 3705I          | I739 |
|                                      | II     | 6                                                    | 69052          | I522 |
|                                      | III    | 18                                                   | 68786          | 5455 |
|                                      | IV     | 3                                                    | 6403           | 9II  |
| Bear Island -<br>Spitsbergen<br>area | I      | -                                                    | 22             | -    |
|                                      | II     | I                                                    | 8              | 8    |
|                                      | III    | -                                                    | 2              | -    |
|                                      | IV     | -                                                    | 105            | -    |
| Norwegian<br>Sea subarea             | I      | 3                                                    | I443           | 364  |
|                                      | II     | 6                                                    | III89          | II39 |
|                                      | III    | I                                                    | I              | I    |
|                                      | IV     | -                                                    | 2984           | -    |

SAMPLING DATA (REDFISH)

| Area                                | Season | Number of<br>samples taken<br>by research<br>vessels | Number of fish |      |
|-------------------------------------|--------|------------------------------------------------------|----------------|------|
|                                     |        |                                                      | Measured       | Aged |
| Barents Sea<br>subarea              | I      | 2                                                    | 8496           | 400  |
|                                     | II     | I                                                    | I2055          | 300  |
|                                     | III    | -                                                    | 5735           | -    |
|                                     | IV     | -                                                    | 623            | -    |
| Bear Island-<br>Spitsbergen<br>area | I      | 3                                                    | 6025           | 500  |
|                                     | II     | 2                                                    | 857I           | 600  |
|                                     | III    | 2                                                    | 37I7           | 600  |
|                                     | IV     | I                                                    | I004I          | 296  |
| Norwegian<br>Sea subarea            | I      | 4                                                    | I5I90          | 904  |
|                                     | II     | 8                                                    | 40494          | 2300 |
|                                     | III    | I                                                    | 2500           | 300  |
|                                     | IV     | I                                                    | 6574           | 300  |

SAMPLING DATA (SAITHE)

| Area                         | Season | Number of samples taken by research vessels | Number of fish |      |
|------------------------------|--------|---------------------------------------------|----------------|------|
|                              |        |                                             | Measured       | Aged |
| Barents Sea subarea          | I      | -                                           | 255            | -    |
|                              | II     | 2                                           | 916            | 402  |
|                              | III    | -                                           | 110            | -    |
|                              | IV     | -                                           | 3              | -    |
| Boar Island-Spitsbergen area | I      | -                                           | -              | -    |
|                              | II     | -                                           | -              | -    |
|                              | III    | -                                           | -              | -    |
|                              | IV     | -                                           | -              | -    |
| Norwegian Sea subarea        | I      | I                                           | 100            | 32   |
|                              | II     | 4                                           | 1406           | 464  |
|                              | III    | -                                           | -              | -    |
|                              | IV     | 7                                           | 22516          | 1551 |
| North Sea                    | II-III | -                                           | 22318          | 2095 |

SAMPLING DATA (GREENLAND HALIBUT)

| Area                           | Season | Number of samples taken by research vessels | number of fish |      |
|--------------------------------|--------|---------------------------------------------|----------------|------|
|                                |        |                                             | Measured       | aged |
| Barents Sea subarea            | I      | -                                           | 562            | -    |
|                                | II     | -                                           | 420            | -    |
|                                | III    | -                                           | 187            | -    |
|                                | IV     | -                                           | 158            | -    |
| Bear Island - Spitsbergen area | I      | I                                           | 682            | 212  |
|                                | II     | I                                           | 919            | 211  |
|                                | III    | -                                           | 167            | -    |
|                                | IV     | -                                           | 762            | -    |
| Norwegian Sea subarea          | I      | I                                           | 927            | 200  |
|                                | II     | -                                           | 193            | -    |
|                                | III    | -                                           | 531            | -    |
|                                | IV     | I                                           | 652            | 220  |

SAMPLING DATA (LONG ROUGH DAB)

| Area                           | Season | Number of samples taken by research vessels | Number of fish |      |
|--------------------------------|--------|---------------------------------------------|----------------|------|
|                                |        |                                             | Measured       | Aged |
| Barents Sea subarea            | I      | 5                                           | I9520          | 922  |
|                                | II     | 2                                           | 7590           | 400  |
|                                | III    | -                                           | I9860          | -    |
|                                | IV     | -                                           | 2365           | -    |
| Bear Island - Spitsbergen area | I      | I                                           | I085           | 300  |
|                                | II     | -                                           | 26I5           | -    |
|                                | III    | -                                           | 3058           | -    |
|                                | IV     | 2                                           | I632I          | 50I  |
| Norwegian Sea subarea          | I      | -                                           | I09I           | -    |
|                                | II     | -                                           | I48I           | -    |
|                                | III    | -                                           | 272            | -    |
|                                | IV     | -                                           | -              | -    |

SAMPLING DATA ( PLAICE)

| Area                           | Season | Number of samples taken by research vessels | Number of fish |      |
|--------------------------------|--------|---------------------------------------------|----------------|------|
|                                |        |                                             | Measured       | Aged |
| Barents Sea subarea            | I      | 4                                           | 2366           | 432  |
|                                | II     | 2                                           | 22I9           | 286  |
|                                | III    | 8                                           | I8704          | I425 |
|                                | IV     | -                                           | I6             | -    |
| Bear Island - Spitsbergen area | I      | -                                           | -              | -    |
|                                | II     | -                                           | -              | -    |
|                                | III    | -                                           | I7             | -    |
|                                | IV     | -                                           | -              | -    |
| Norwegian Sea subarea          | I      | -                                           | I              | -    |
|                                | II     | -                                           | -              | -    |
|                                | III    | -                                           | -              | -    |
|                                | IV     | -                                           | -              | -    |

SAMPLING DATA ( CATFISH )

| AREA                                | Season | Number of<br>samples taken<br>by research<br>vessels | Number of fish |      |
|-------------------------------------|--------|------------------------------------------------------|----------------|------|
|                                     |        |                                                      | Measured       | Aged |
| Barents Sea<br>subarea              | I      | 2                                                    | 4068           | 200  |
|                                     | II     | 3                                                    | 1418           | 283  |
|                                     | III    | 2                                                    | 4259           | 100  |
|                                     | IV     | -                                                    | 529            | -    |
| Bear Island-<br>Spitsbergen<br>area | I      | -                                                    | 208            | -    |
|                                     | II     | -                                                    | 492            | -    |
|                                     | III    | I                                                    | 419            | 20   |
|                                     | IV     | I                                                    | 1236           | 100  |
| Norwegian Sea<br>subarea            | I      | -                                                    | 285            | -    |
|                                     | II     | I                                                    | 199            | 24   |
|                                     | III    | -                                                    | 72             | -    |
|                                     | IV     | -                                                    | 138            | -    |

Demersal Fishes (southern)

In 1978 eight cruises were made to different areas of the Central East Atlantic.

The trawling surveys on abundance were conducted in order to establish the state of the marine resources in the Central East Atlantic. In addition, oceanographic investigations were made and data collected for biological studies of the major fish species.

A total of 890 hauls were made and 1 160 hydrographical stations occupied.

The data on the major fish species are given on the following page.

| Species                      | Mass<br>Measurements | Biological<br>Analysis | Age<br>Samples |
|------------------------------|----------------------|------------------------|----------------|
| <u>Pagellus coupei</u>       | 11 804               | 2 537                  | 784            |
| <u>Dentex macrophthalmus</u> | 5 036                | 1 260                  | 250            |
| <u>Dentex congoensis</u>     | 3 944                | 1 191                  | 513            |
| <u>Dentex angolensis</u>     | 619                  | 460                    | 150            |
| <u>Dentex polli</u>          | 8 992                | 1 892                  | 500            |
| <u>Pagellus acarne</u>       | 5 900                | 3 891                  | 873            |
| <u>Merluccius merluccius</u> | 7 676                | 2 264                  | 522            |
| Pomasasyidae                 | 11 474               | 1 458                  | 350            |
| Sciaenidae                   | 5 113                | 1 000                  | 500            |
| Others                       | 1 874                | 750                    | 350            |

The minimum abundance and biomass of 36 species were estimated.

Sparids were reported to prevail among deep-sea fish: Dentex macrophthalmus, D. angolensis, Pagellus coupei, Pomadasyidae and Sciaenidae.