

D e m e r s a l F i s h (N o r t h e r n) C o m m i t t e e

By A. MEYER

1969

Belgium
(P. Hovart)

The stock analysis by means of market sampling and of research vessel catches was continued. Age, length, weight, sex and stage of maturity of cod, whiting, plaice and sole were determined.

A start was made with the tagging of cod.

The distribution and abundance of spawning sole are studied along the Belgian coast and tagging experiments will be carried out in April and May 1970.

Canada
(W. Templeman & F.D. McCracken)

Routine sampling of landings of demersal fish from ICNAF Sub-areas 2 to 5 was continued in 1969. Length and age data were recorded for cod, haddock, redfish and flatfish, length for pollock. Demersal fish research cruises were made in all these sub-areas.

Cod

The inshore Labrador cod fishery was a failure and that on the north-east coast of Newfoundland very poor whereas on the east coast of Newfoundland in ICNAF Division 3L the coastal trap and handline fishery was more successful than for several years previously. In the autumn the fishery was less successful for line gears since squid did not appear and squid bait was lacking. In the coastal fishery of this division the 1964 year-class was dominant in the trap and handline catches whereas the long-line and gill-net catches were dominated by fish of the 1961 and 1962 year-classes.

On the Grand Bank in Divisions 3N and 3O, cod of the 1966 and 1967 year-classes were most numerous.

In the southern Gulf of St. Lawrence (ICNAF Sub-area 4T) the 1965 and 1966 year-classes predominated. Tagging studies in this sub-area confirmed that cod move seasonally from the Magdalen Shallows (summer) to the Laurentian Channel (winter).

Haddock

Research vessel surveys showed that on St. Pierre Bank in March the 1966 year-class was most abundant whereas the 1967 and 1968 year-classes appeared to be almost completely lacking and that on the south-western slope of the Grand Bank (ICNAF Division 3O) in November haddock were extremely scarce, only 54 in 12 sets, all large haddock, and with no evidence of successful year-classes in recent years.

Research vessel surveys in ICNAF Divisions 4X and 4W indicate a poor 1968 year-class. Tagging confirmed that the Bay of Fundy fishery in winter and spring is based on migrants from Brown's Bank.

Redfish

An echo-sounder survey by the "A.T. Cameron" in August in the Labrador Sea together with baited handline fishing revealed large numbers of Sebastes mentella almost continuously distributed from a position midway between Labrador and Greenland to the Labrador Shelf. These redfish were usually at 135-275 m. Haemoglobin electropherograms of redfish, morphologically

Sebastes marinus and Sebastes mentella from the north-west Atlantic, showed two completely different types of patterns, one consisting of five bands and the other of seven - and none of the same mobility.

Flatfish

An analysis of the log book records of Newfoundland commercial trawlers fishing principally for American plaice (long rough dab) on the Grand Bank in 1956-68 indicated that although the catch generally increased the catch per hour has gradually declined from 854 kg in 1956 to 500 kg in 1968. Comparison of growth curves for 1953-56 and 1965-68 of American plaice landed by commercial trawlers shows an increase in size at age of about 5 to 6 cm for the northern half of the Grand Bank and 8-9 cm for the southern half.

Yellowtail flounders have apparently increased in abundance on the Grand Bank since 1961-62.

Two hundred and thirty-eight Greenland halibut were tagged in White Bay, the single return showing a migration of about 75 nautical miles in two months. Catches of Greenland halibut per gill-net and the average size of the fish in Trinity Bay have decreased under an intensive fishery in recent years.

On the Nova Scotian Shelf witch flounder larvae have been shown to remain pelagic for about one year; metamorphosing juveniles settle in 180-460 m and remain up to 5 years; young adults move to fishing grounds on banks.

Sand launce

Existence of different morphometric characteristics (mainly maximum length) in groups from different areas was confirmed.

Argentine

In late January fish from Western Bank were much further advanced in sexual maturity (late ripening) than those from Banquereau (early ripening).

Fish eggs and larvae

Four plankton cruises were made in the southern Gulf of St. Lawrence in relation to fish recruitment studies.

Additional groundfish research surveys

The first of an annual series of groundfish trawling surveys based on a stratified random sampling design was made in July in ICNAF Division 4X.

Direct comparisons of otter-trawl catches (on the "A.T. Cameron") with simultaneous fish counts by prototype echo-sounding equipment (on the "E.E. Prince") were made in the Laurentian Channel in relation to fish assessment studies.

Denmark

(H. Knudsen)

Cod

At the Faroes, investigations on commercial catches and trawlings from "J. Chr. Svabo" showed that the stock of cod is quite large, mainly due to the presence of the good 1964 and 1965 year-classes.

In the Baltic trawlings from "Dana" in April-May gave very good catches of the 1968 year-class SE of Bornholm. Both here and in Stolpe Rende good catches of the 1966 and 1967 year-classes were obtained, while in the latter area the 1968 year-class was weak.

In the western Baltic investigations with the standard trawl in November gave very good catches of 0-group and 1-group cod, while the 1967 year-class was very weak.

In January 1 075 cod were tagged in the western Baltic and in April-May 1 482 cod were tagged in the area SE of Neksø, in Stolpe Rende and in Gdańsk Bay.

Haddock

In April 600 haddock were tagged with internal iron tags in the southern North Sea and in June further 150 were tagged.

Lumpsucker

In April 2 922 lumpsucker were tagged in the southern Kattegat and this concluded the experiments with this species.

Plaice

Quantitative fishing for young plaice along the shore was carried out in July and August from the motorboat "Havkatten". The number of plaice per haul was about normal in all areas except the central Kattegat, where the catch was below the mean, and the Sound, where the catch was much higher than normal.

The length and age composition of the plaice stock in the eastern and northern Kattegat was investigated in June from "Dana". In the northern area the 1965 year-class constituted more than half of the catches, while the 1966 year-class was the most numerous in the south-eastern area.

Sole

In the Danish commercial catches in June the 1963 and 1964 year-classes constituted about 60%.

Greenland

(Sv.Aa. Horsted)

Cod

Hauls with 2 m stramin net on various sections off West Greenland showed spawning to take place in April-May along the western slopes of the fishing banks. Unfortunately no hauls were made in July so that comparison of abundance of cod larvae with previous years' abundance is very difficult, but the numbers caught in June and August indicate the 1969 cod year-class to be rather poor (as also suggested from observations of water temperatures).

Some standard trawl stations have been operated with small meshed otter-trawl in an attempt to judge the abundance of pre-recruits, but as we have no material from comparison any judgment is at present difficult. There is, however, no real sign of any very good year-class among the pre-recruits.

Commercial sized cod have been sampled inshore and offshore from research vessels and from commercial catches. The first big Greenland trawler started fishing offshore in 1969. Her catches have been regularly sampled.

The 1965 year-class recruited to the fishery and was very abundant in inshore catches in the Sukkertoppen and Holsteinsborg districts. This year-class is supposed to be by far the most important in the 1970 fishery on the northern fishing banks, whereas it may be less abundant on the southern banks. No real outstanding year-class seems to be present in the stock in most recent years and in the nearest future. The 1961 and 1963 year-classes are, therefore, still of relative importance in the samples.

The Greenlanders' cod fishery was of the same size as in 1968 in spite of severe ice conditions and small catches in southern Greenland.

2 487 cod were tagged. Of these 1 205 were less than 50 cm, mainly tagged in inshore waters.

Redfish

Due to extraordinary ice conditions in the Godthåb Fjord the planned tagging of redfish from commercial pound nets nearly completely failed. Only 27 specimens were tagged.

Greenland halibut

The outstanding commercial fishery carried out from the ice during winter in Jakobshavn Isfjord was studied.

In Godthåb Fjord 1 075 specimens caught mainly on long-lines were tagged.

Other fish

As in previous years most species in research vessel catches were measured, among these especially American plaice, wolffish, Gadus ogac, and other Gadidae.

France

(G. Lefranc)

Morue

Les observations entreprises en 1968 sur les caractères biologiques et biométriques des morues appartenant aux populations de la Mer du Nord septentrionale ont été poursuivies. L'examen des contenus stomacaux des morues du Détroit du Pas-de-Calais a permis de déterminer leur régime alimentaire.

Des relevés statistiques effectués régulièrement sur les apports des bateaux travaillant dans le centre et le sud de la Mer du Nord permettent de suivre mensuellement la composition en taille et en âge des morues fréquentant ces deux secteurs.

En août 1969, au cours d'une mission de "La Thalassa", 527 morues ont été marquées dans le sud du Dogger Bank.

Merlan

L'étude du stock de merlans du sud de la Mer du Nord a été continuée, elle porte principalement sur les caractères biologiques, métriques et méristiques, sur l'âge, sur la taille, sur la maturité sexuelle ainsi que sur la teneur en lipides. Les échantillons ont été prélevés à bord des chalutiers (sud Mer du Nord) ou à bord de "La Thalassa" (sud Dogger Bank).

Germany

(A. Meyer)

Continuation of the biological studies at sea (research ships, factory trawlers) and at the markets with length measurements, otolith sampling, maturity and food on:-

Cod: Baltic Sea (5 400 taggings), North Sea (2 300 taggings), Iceland (596 blood samples, 258 taggings), E. Greenland (sampling of roe for egg counting), Norwegian Coast, Bear Island and Barents Sea.

Haddock: North Sea, Iceland, Norwegian Coast, Barents Sea.

Saithe: Iceland, Faroes, Norwegian Coast.

Redfish: Iceland, E. Greenland, Irminger Sea, Norwegian Coast, further studies on ageing techniques.

Whiting: North Sea.

Sole: North Sea (1 949 taggings).

Plaice: North Sea (4 032 taggings).

Dab: North Sea (1 632 taggings).

Flounder: North Sea (281 taggings).

Research trips for demersal fish

a) "Anton Dohrn"

January: North Sea (scouting trip for the fleet of German cutters).
February: North Sea (plaice and cod, eggs and larvae).
March: Iceland (cod (blood sampling), haddock, redfish (ageing techniques), saithe).
April: Baltic Sea (cod tagging, flatfish).
October: Norwegian Coast, Bear Island, Barents Sea (cod, haddock, saithe (taggings), redfish).

b) "Walther Herwig"

March: East Greenland (cod, redfish).
July: Bear Island, Norwegian Coast (cod).

Iceland
(Jón Jónsson)

Work at sea

The R.V. "Hafthor" made four cruises for work on species coming under this Committee. A total of 151 trawling stations were operated in Icelandic waters. In March the vessel took part in an international survey on the blood of the cod on the Icelandic spawning grounds. These investigations were carried out in order to estimate the amount of cod migrating from Greenland to the Icelandic spawning areas.

Sampling

Cod. A total of about 15 000 otoliths were taken on research vessel cruises and on land stations, and about 39 000 were measured with regard to length only. 4 605 cod were tagged on 40 localities. 600 otoliths were taken from East Greenland fishing grounds.

Haddock. Otoliths were taken from 3 254 haddock and 144 were tagged.

Catfish. Otoliths were collected from 754 fish and 413 were tagged.

Besides this, a substantial number of otoliths were collected from the following species: whiting, saithe, ling, Norway pout, plaice and Greenland halibut.

Ireland

No work on demersal fish.

Netherlands

(P. Korringa)

Work at sea

The R.V. "Tridens" made 18 cruises in the Committee's area of which 10 were mainly devoted to work within the scope of the Demersal Fish (Northern) Committee.

The corresponding number of cruises made by the R.V. "Willem Beukelsz" were 10 and 6.

Work on fish

Plaice. The stock analysis by means of market sampling was continued. Further research was devoted to a trematode causing abnormal pigmentation in juvenile plaice.

Sole. The stock analysis by means of market sampling and racial investigations on sole from different localities in the southern North Sea was continued. Tin-tow net cruises were made in the Channel and in the coastal areas of Belgium, the Netherlands, Germany and Denmark. An analysis of the catches of undersized sole in the Dutch, German and Danish coastal area on a standard network of stations in the Zealand estuaries, and in the Dutch Waddensea was made in order to be able to predict commercial catches and to assess the importance of the Waddensea nursery ground in relation to the adult stock.

In spring adult soles were tagged on the White Bank and juvenile soles in the Waddensea and Zealand.

Turbot and brill. Occasionally turbot and brill were tagged during a sole tagging programme.

Cod. 2 000 cod were tagged in the southern North Sea. The study of the predator-prey relationship was continued. Young roundfish surveys were made in February and August.

Cod, haddock and whiting. The stock analysis by means of market sampling was continued.

Norway

(A. Høyen)

Market sampling of cod, haddock and coalfish was continued in ports along the coast from Møre to Vardø at a similar level as in previous years. The fish sampled were measured, otoliths were collected for age determination, and the maturity stages were determined. Discarding of fish by Norwegian trawlers in Sub-area I and Divisions IIa and IIb was studied during spring and autumn. All together 25 902 otoliths were collected and 164 901 fish were measured.

A total of 3 451 purse-seine caught north-east Arctic cod were tagged during March in the spawning area. During August-September 1 348 Danish-seine caught cod, 836 haddock and 561 coalfish were tagged in coastal areas from Vestfjord to North Cape.

Routine echo-surveys for studying the distribution and abundance of spawning north-east Arctic cod were carried out during February-March with R.V. "Havdrøn", R.V. "Peder Rønnestad" and R.V. "G.O. Sars".

Further studies of the abundance, distribution and mortality of cod eggs and larvae in the area Lofoten - Finnmark have been carried out. All samples which are basis for the studies have been collected from the middle of March to the end of June on surveys with R.V. "Asterias" and R.V. "G.O. Sars".

In August/September the distribution and abundance of 0-group cod, haddock, redfish, long rough dab and polar cod in the Barents Sea, round Bear Island and along west Spitsbergen coast were studied. R.V. "G.O. Sars" and R.V. "Johan Hjort" together with an U.K. and two Soviet research vessels took part in the survey.

The effect of the use of 80 mm mesh size in cod-ends in the Norwegian trawl fishery for coalfish in the area between 62° and 64°N and east of 4°E were examined in January 1969 by the Coalfish Working Group. In accordance with the recommendations made by this Working Group the Norwegian investigations were intensified. A total of 1 165 coalfish were tagged during summer in the area, and two sampling surveys with R.V. "G.O. Sars" were carried out during October-November. All together 1 741 otoliths were collected and 3 088 fish were measured, mainly coalfish.

Young coalfish affected by vibriose were reported from some places along the west coast of Norway.

Poland

(B. Draganik)

Baltic

Cod. As in the previous years, the 1969 samples were taken from the commercial catches in the southern Baltic for determination of size, weight, sex, stage of maturity and age composition.

In total, 34 550 cod were measured and 5 405 otoliths were collected. In a sample of 350 cod the number of vertebrae and rays in D2 was determined.

Tagging of cod was continued in the period from January to April and 3 360 fish were tagged.

Flatfish

Flounder. 4 908 specimens from the commercial catches in the southern Baltic were measured and 2 781 fish were investigated with regard to size, sex, stage of maturity and age.

Plaice. 947 specimens caught in the southern Baltic were investigated as to size, sex stage of maturity and age.

North Sea

The data collected are shown in the following table:-

Species	Number of fish	
	Length measured	Analyzed
Cod	616	150
Haddock	4 043	795
Saithe	1 039	100
Whiting	1 727	176
T o t a l	7 425	1 221

Celtic Shelf

The collected data are shown in the following table:-

Species	Number of fish	
	Length measured	Analyzed
Haddock	2 582	596
Whiting	2 270	502
Saithe	450	100
T o t a l	5 302	1 198

Barents Sea

Investigations on the status of the major commercial fish stocks were started in 1969. Detailed data were obtained from biological analysis of 2 351 cod, 100 saithe, 90 haddock and 110 redfish. Length measurements were made of the following species: 1 257 saithe, 40 750 cod, 907 haddock and 2 147 redfish.

Portugal

Spain

Sweden

(G. Otterlind)

In the international cod tagging programme organized by the Working Group on Assessment of Demersal Fish Stocks in the Baltic, 8 056 cod were marked from Swedish side (7 270 with Lea tags and in two comparative experiments additionally 786 with German spaghetti tags). The main part of this activity was performed in the southern and central Baltic. In the Åland Sea 300 cod were tagged and 270 in the Landsort area of the northern Baltic proper. About 800 cod have been examined and length measurements taken from the catches of our research vessels in the Baltic.

As in previous years, samples of eggs and larvae, especially of cod, have been collected with the 1 m net in different areas of the Baltic proper. Investigations into the bottom fauna and of the feeding habits of the cod have been intensified to elucidate the relation to the changing oxygen conditions in the Baltic deep basins.

United Kingdom

1. England & Wales

(M.J. Holden)

Both the number of measurements and the number of otoliths, spines and vertebrae taken for age determination in the market sampling programme for the whole of the North Atlantic were greater in 1969 than in 1968, the former by 8 per cent and the latter by 12 per cent. The number of stocks sampled remained the same. A total of 829 852 fish were measured and 36 169 otoliths, 1 458 spines (spiny dogfish) and 1 235 vertebrae (rays) were collected.

The R.V. "Ernest Holt" participated in the international O-group survey in the Barents Sea in August-September. The vessel also made an echo-survey of the fishing grounds north of Iceland in July to collect more biological data in relation to the proposed closure by Iceland of the north-east corner of the Icelandic continental shelf. The possibility of carrying out O-group fish surveys in the pelagic scattering layer off Iceland was also assessed during this cruise. In March and April the R.V. "Ernest Holt" collected blood samples from Icelandic cod in order that the genetic composition of the stocks could be analysed. This work was carried out in co-operation with German and Icelandic research vessels. During the July cruise further cod blood samples were collected.

Work on assessing changes both in the distribution and biology of the North Sea plaice populations and in alterations in fishing effort on these populations was continued in 1969, together with work on assessing competition between plaice and dabs for food (four cruises of R.V. "Corella" in January, March, July and October).

Research on the migration and exploitation of sole, ray and cod populations in the North Sea was continued, during which the following tagging programme was completed:

Species	No. tagged	Month	Area	ICES Division	Vessel
Cod	80	January	Flamborough Head	IVb	"Tellina"
Sole	257	August	Flamborough Head	IVb	"Corella"
Ray	243	May	Flamborough Head	IVb	"Corella"
Ray	353	September	English east coast	IVc	"Tellina"
Ray	949	September-October	Thames Estuary	IVc	Commercial

2. Scotland

(R. Jones)

Routine sampling of demersal fish in the North Sea and Faroes was carried out as usual on research ship catches and commercial vessel landings. The North Sea was sampled by F.R.S. "Scotia" in March and May, and the Faroe area by F.R.S. "Explorer" in June. The sampling of commercial landings of cod, haddock and whiting was again carried out at the principal Scottish trawl and seine ports, as in previous years, but in addition sampling was extended to include plaice, lemon sole, megrim, saithe and hake from selected areas. All fish were measured and scale and otolith samples were taken for age determination.

These data were used in preparing forecasts of the short-term fishing prospects for these species. They were also compiled for publication in Annales Biologiques and the ICES Statistical News Letters.

Tagging of cod, haddock, whiting, plaice and lemon sole was carried out in Scottish and Faroese waters. Thanks to the co-operation of the Fisheries Research Laboratory in Thorshavn it was again possible to tag ~~hand-line~~ caught haddock in Faroese waters.

Cruises were made to Rockall in spring and to the Faroe-Iceland area in September/October and December, to investigate the distribution and abundance of blue whiting and its availability to capture by bottom and pelagic trawls during the spawning and post-spawning periods.

In connection with the tagging programme, further experimental work was done aimed at increasing the survival rates of tagged gadoids caught by normal fishing methods by raising them slowly to the surface and by tagging underwater. Associated studies were also made of the structure and mechanics of the swim-bladder in relation to the effects of rapid decompression during hauling.

Observations of the mating and spawning behaviour of haddock and whiting were again made in the laboratory's aquarium. Further work was carried out on the sensitivity of fish to different frequencies of sound.

In June/July a preliminary cruise was made in the North Sea to sample young gadoids at the stage in their life-history just before they are normally taken on the bottom by small meshed sampling gears.

Experiments were done, using haddock, whiting and cod, to determine the relationships between growth and condition factor and the level of feeding.

Fecundity determinations have been continued on cod and whiting from various areas.

Examination of the parasites of plaice revealed four parasites which may be useful biological indicators in tracing the migrations of adult plaice in relation to their nursery grounds of origin.

U.S.S.R.

(G.V. Nikolsky)

Investigations on assessment of the North Sea haddock stock were continued by AtlantNIRO. Analysis was made of otolith weight of haddock from different parts of the North Sea and adjacent areas. Year-class strength was studied during two trawl surveys; the first one from 22nd March to 8th May, the second from 5th October till 4th December. During the whole year biological information was collected by the research vessels of AtlantNIRO.

I. Mass measurements of fish

a) Taken from commercial trawls:-

Total	88 725 specimens
Haddock	30 514 specimens
Pollack	29 371 specimens
Whiting	2 511 specimens
Norway pout	13 593 specimens
Poutassou	12 500 specimens
Cod	236 specimens

b) Taken from trawls with smallmesh cover:-

Total	88 623 specimens
Haddock	51 748 specimens
Pollack	5 039 specimens
Whiting	17 190 specimens
Norway pout	13 698 specimens
Cod	988 specimens

II. Age determinations

Total	5 770 specimens
Haddock	1 310 specimens
Whiting	1 246 specimens
Pollack	1 556 specimens
Poutassou	911 specimens
Norway pout	747 specimens

III. Race analyses

Haddock	479 specimens
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IV. Otolith weights

Total	7 771 specimens
Haddock	2 825 specimens
Whiting	1 000 specimens
Poutassou	3 946 specimens

Note: Data obtained in 1969 from the vessels still being at sea are not included in the report.

As in previous years, the Polar Research Institute of Marine Fisheries and Oceanography collected in 1969 data to describe the abundance, length and age composition and distribution of cod, haddock, redfish, Greenland halibut and other bottom fish. Detailed data by areas are included in the two Tables included in this report. They were collected onboard research and scouting vessels.

In 1969 investigations were conducted in order to obtain a refinement of the estimation of the abundance of stocks of the main fish species, as well as the conditions of survival of the young at different stages of development; ichthyoplankton was gathered and analysed; fishery forecasts

were made and the development of methods for forecasting ~~was~~ continued. The R.V. "Alaid" made a trip to the Icelandic waters.

The Baltic Institute of Fisheries continued investigations on the abundance of the stocks of cod and flounder in the eastern Baltic.

The Moscow State University studied the development of the White Sea fish. Biochemical analysis of flounder was made in the White and Baltic Seas.

Programme of investigations for 1970

In 1970 we shall continue studies on the length and age composition and abundance of bottom fish in the Barents Sea and in the area of Iceland. It is intended to study the problems on reproduction (ichthyoplankton, fecundity, environmental conditions of pelagic and bottom young fish, etc.) to a greater degree than during the previous year. In addition, we will work on the improvement of methods for forecasting, and the fishing fleet will be supplied with manuals. New species of fish, for instance saithe will become the object of investigations.

Assessments of haddock stocks in the North Sea will be continued. Besides, more extensive studies on pollack stock assessment will be started in 1970. We also plan to study age-length structure of whiting.

Two trawl surveys will be carried out in March-April and October-November.

The regular surveys on the state of cod and flounder stocks in the Baltic Sea will be continued.

The studies on development of demersal fish in the White Sea will be continued.

Table 1. Biological data collected in Icelandic waters in 1969 and analysed.

Species	Measured	Age		Fatness	Field analysis of feeding	Tagged
		Collected	Analysed			
Cod	8 982	845	-	400	2 172	314
Haddock	5 467	-	-	-	753	-
Redfish	14 721	200	-	-	4 514	-
Halibut	30 947	1 670	-	-	6 103	2 180
Other	5 350	-	-	-	1 435	-
Total	65 467	2 715	-	400	14 977	2 494

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Table 2. Biological data collected in the Barents Sea in 1969 and analysed.

Species	Measured		Age				Fatness	Field analysis of feeding	Tagged	Ring-trawl		Ichthyoplankton		Samples in trawl attached to net		Benthos	
	Adult	Young	Collected		Analysed					Col-lect-ed	Ana-lysed	Col-lect-ed	Ana-lysed	Col-lect-ed	Ana-lysed	Col-lect-ed	Ana-lysed
			Adult	Young	Adult	Young											
Cod	476 355	3 425	23 495	673	21 866	673	10 392	37 141	4 877								
Haddock	27 298	5 956	5 789	754	5 789	754	3 000	9 577	58								
Redfish	40 506	12 563	7 664	4 026	2 910	-	-	10 379	-								
Halibut	34 714	-	2 018	-	-	-	-	4 346	1 057								
Other	44 543	-	1 535	-	-	-	-	7 174	3								
Total	623 416	21 944	40 501	5 453	30 565	1 427	13 392	68 617	5 995	501	501	3 315	230	120		466	198