LEAGUE OF NATIONS

ORGANISATION FOR COMMUNICATIONS AND TRANSIT

AIR TRANSPORT CO-OPERATION COMMITTEE

SPECIAL SUB-COMMITTEE TO STUDY THE QUESTION OF THE CONSTITUTION AND OPERATION OF A MAIN NETWORK OF PERMANENT AIR ROUTES

ECONOMICS OF AIR TRANSPORT IN EUROPE

Report submitted to the Sub-Committee

BY

M. HENRI BOUCHÉ,
Editor of *L'Aéronautique.*

Final Edition

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Publications of the Communications and Transit Section

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* * *

PREFACE.

In 1934, the Secretary-General of the League of Nations sent to the Governments of European States a " provisional edition " of the present report requesting them :

(1) To communicate to him any observations and corrections which they might consider necessary ;

(2) To forward to him information and statistics relating to 1933 which would enable a more up-to-date " final edition " to be issued.

Although some of the replies received were much less comprehensive than others, they contained sufficient material to enable me to complete my task.

The final report consists therefore of two parts :

The first part is entitled : *The Economic Evolution of Air Transport in Europe, 1930-1933.* The text is taken from the " Provisional Edition ", the last chapter of which was written in December 1933 and was communicated to Governments early in 1934. I have only inserted as footnotes or embodied in the text a few corrections of points of detail supplied by the competent administrations.

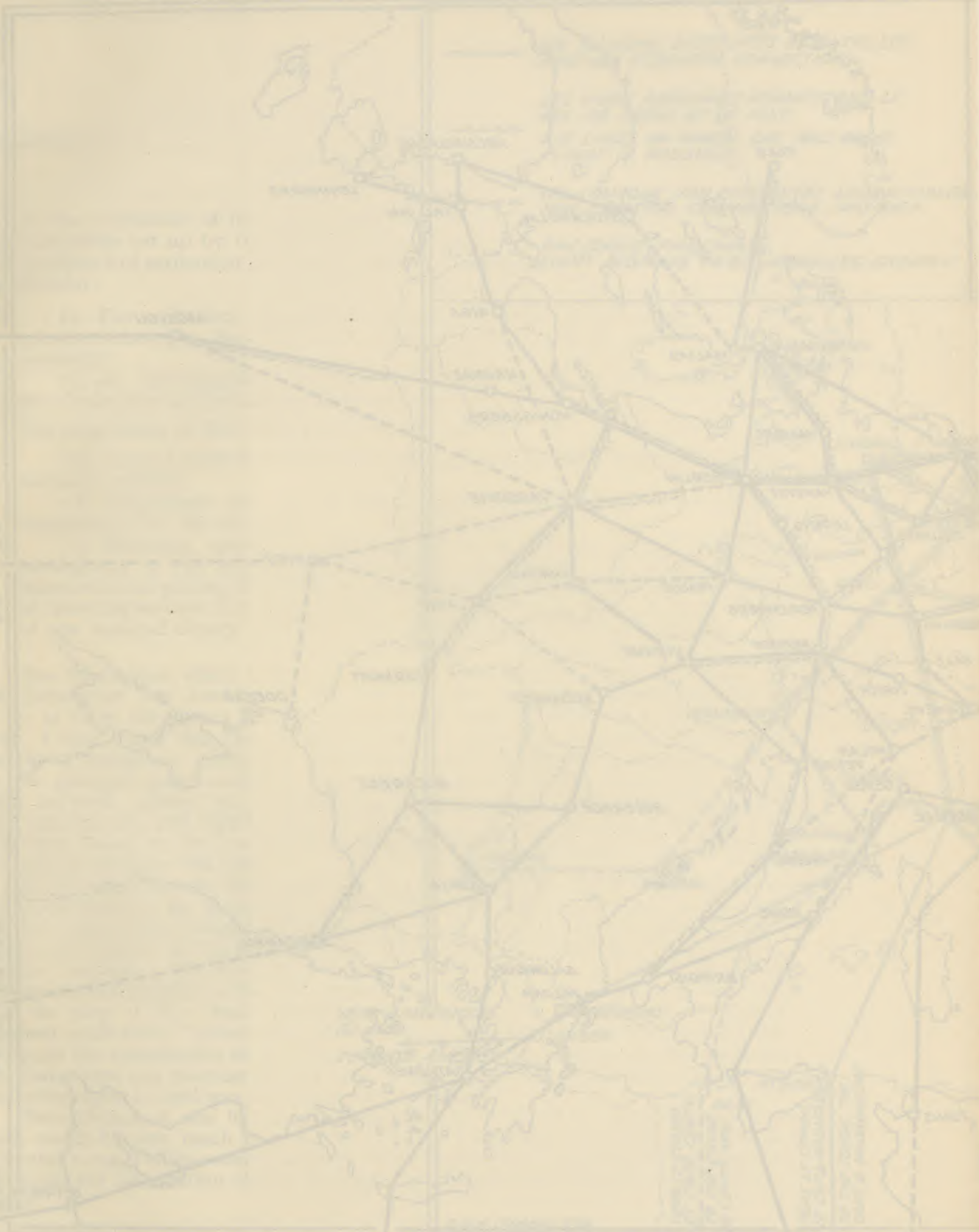
The second part of the report is entitled : *The Evolution of Air Transport in Europe in 1933.* It gives the chief statistical results and points out, where necessary, the differences between them and the results for the three years 1930-1932. It will be seen that, as a whole, these differences do not reflect unforeseen changes.

At the beginning of 1935, therefore, my conclusions remain the same as those reached by me in 1933 and which are to be found at the end of the first part of the report.

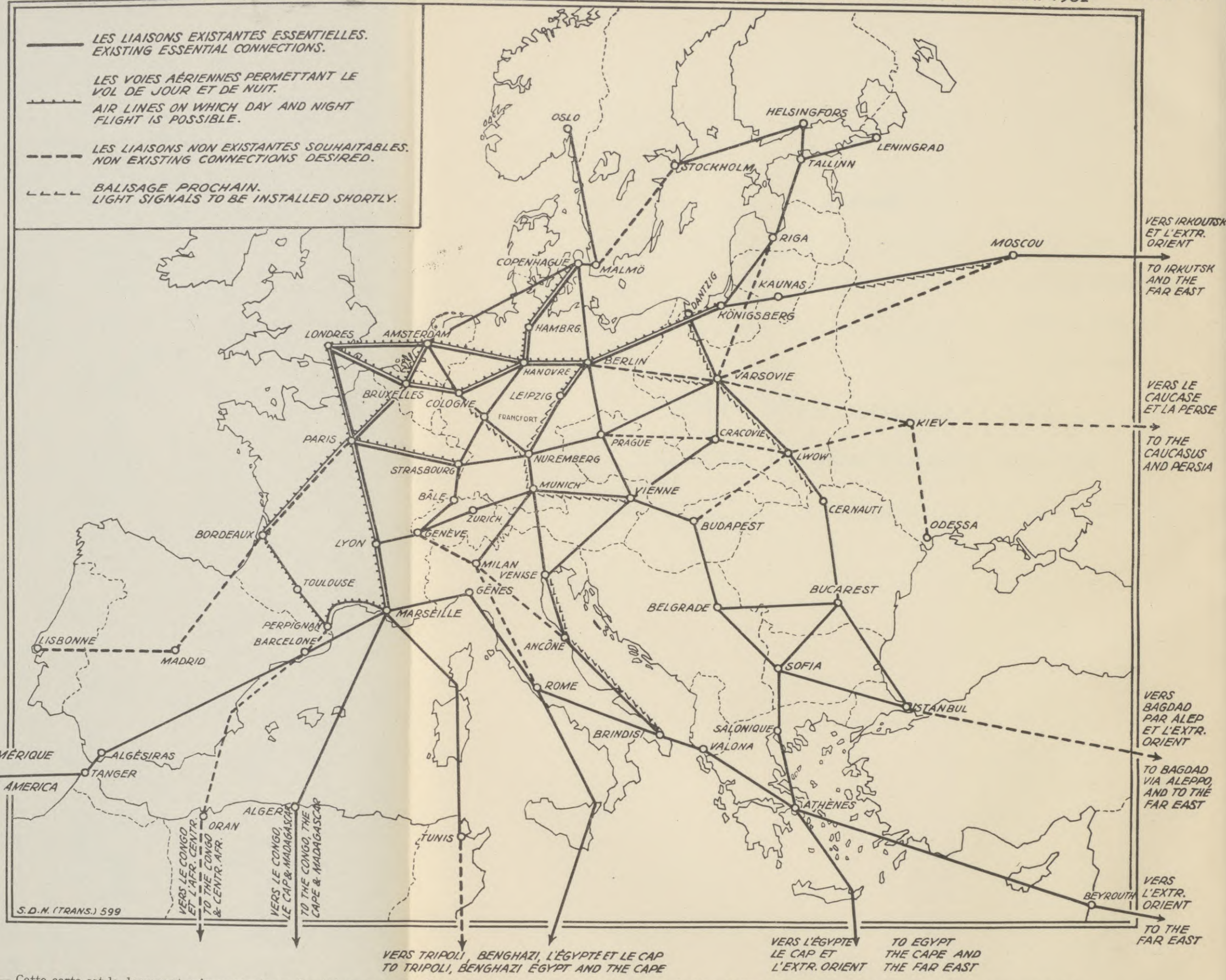
Part I.

THE ECONOMIC EVOLUTION OF AIR TRANSPORT IN EUROPE.

1930 - 1933



CARTE A. CARTE DU "RESEAU PRINCIPAL" SUGGÉRÉ EN MAI 1932 - MAP OF "MAIN NETWORK" SUGGESTED IN MAY 1932 MAP A.



Nota. — Cette carte est le document même soumis au Comité en 1932. Le Gouvernement italien fait observer que la ligne Milan-Rome doit compter parmi les « liaisons existantes ».

Note.—This map is the actual map submitted to the Committee in 1932. The Italian Government points out that the Milan-Rome Line is now to be reckoned as one of the " existing connections ".

[*Translation.*]

INTRODUCTION.

At the conclusion of its session held from November 10th to 12th, 1931, the Sub-Committee set up by the Air Transport Co-operation Committee to study the "main network of permanent air routes" agreed upon a programme of work comprising, in particular :

(1) The collection, through its members themselves, of documents and opinions relating to the plan of the main network, its ground organisation and operation ;

(2) An investigation based on the foregoing information, which the Sub-Committee decided to entrust to me.

The programme of this investigation was as follows :

(a) Present methods of operating air communications in the proposed international network ;

(b) Programme and cost of the installation and working of the ground organisation for the network ;

(c) Minimum operation programme, taking account of the economic possibilities of the network and calculating successfully the effect of new agreements for pooling between companies, of a network in which all overlapping of operating services is avoided, and, assuming these two requisites to be attained, of new material closely adapted to the nature and extent of the air traffic.

The information which the members of the Sub-Committee were to transmit to the Secretariat was received in the early months of 1932. Unfortunately, in so far as these documents and opinions were intended to serve as a basis for my work, I soon found that they would not be of much assistance to me in carrying out the investigation. Only four members of the Sub-Committee stated their views on the principal point—namely, "the most rational operation programme of the main network, taking into consideration existing statistics"—while one of the four pointed out, and rightly so, that these statistics were of very little value, as they were based on the use of materials which were more or less well adapted to the various services and lines.

In the meantime, the Sub-Committee was convened at Geneva in connection with the Conference for the Reduction and Limitation of Armaments, and, on May 6th and 7th, 1932, it was obliged, without having at its disposal any preliminary report, to give its opinion on the plan, ground organisation and operation of the so-called "main" network. The Committee, which met from May 9th to 12th, inserted the conclusions and opinions of the Sub-Committee in its final report, explaining, however, that the map of the "main network" submitted by the Sub-Committee (*Map A attached*) would serve, "if necessary, after revision", as a basis for its further enquiries. Although the examination of the question by the Sub-Committee and afterwards by the Committee was necessarily very brief, the problem with which your Rapporteur was called upon to deal was no longer intact.

Nevertheless, it was by no means elucidated. I therefore concluded that my work would be very much more useful if, before embarking upon the investigation entrusted to me, I endeavoured to collect, for European commercial aviation, statistical and technical information clearly showing the economic and financial results of the traffic.

I accordingly proposed the despatch of two questionnaires.

The first questionnaire, which was intended for the International Air Traffic Association (I.A.T.A.) and was officially communicated to it, read as follows :

1. Definition of the various kinds of agreements between contractual air transport companies (pools or more limited agreements for joint operation or simply for representation).

2. List of pools and agreements registered by or known to the I.A.T.A., with a list of companies parties thereto and of the air services to which they relate.

3. If possible, examples (naturally of a general nature) of the terms of the agreements.

After considering the matter, the I.A.T.A. stated that it was not in a position to reply to the questionnaire.

The second questionnaire, which was primarily intended only for countries whose nationals are members of the Committee, was subsequently also sent to the Governments of other European countries. This questionnaire is reproduced below :

Questionnaire.

Total resources, in the case of each country, of subsidised air services within the territorial limits of the " main network " studied by the Committee—*i.e.*, continental Europe and the Mediterranean basin as far as Istanbul, Beirut and Alexandria on the east, and Casablanca on the west.

I. Resources of Non-commercial Origin.

A. Annual resources (for the last three budget years), distinguishing, if possible :

(1) Annual resources derived from the State budget, and made available :

(a) For subsidies, mileage premiums and mail subsidies (paid to the enterprises concerned) ;

(b) For ground organisation and working operations (not paid to the air transport companies) ;

(2) Annual resources derived from budgets other than the State budget (federal States or cantons, cities, colonies, protectorates or mandated territories) (distinguishing *(a)* and *(b)* as under 1 above) ;

(3) Annual resources derived from public bodies not of an administrative character (chambers of commerce, etc.).

B. Exceptional resources or contributions (after the establishment of the enterprises) :

(1) Participation of the State or of various public bodies in the capital of the enterprises (initial capital or increase of capital) ;

(2) Guarantee for bond issues (and, in such case, the date and amount of the issues).

It would be desirable to know the actual amount of the capital (shares and debentures) of each enterprise undertaking contractual air services.

II. Commercial Receipts (for the last three years of operation).

The constituent elements of these receipts to be shown *in the case of each line*, distinguishing :

Passenger transport ;
Goods transport and excess luggage receipts ;
Mail transport ;

and indicating, if possible, in the case of each category :

The actual quantities transported ;
The kilometric quantities (passenger-kilometres and ton-kilometres) produced ;
The corresponding receipts ;
The coefficient of utilisation of the communications in question (relation of the number of kilometric tons utilised to the number of kilometric tons offered).

III. Tariffs.

Variation during the three years under consideration of the air transport tariffs.
Accompanying variation of competing transport tariffs (land or sea transport).
The variation in question is, of course, the variation in the basic tariffs (per kilometre, per kilogramme or per given quantity of mail) and not the variation of tariffs in the case of each line. Where, however, in the case of particular lines, there are tariffs which are appreciably different (higher or lower) from the general tariff, in order to take account of local conditions, it would be desirable to give particulars.

Actually, all the countries concerned replied to this questionnaire, but, on the one hand, the replies were received at intervals from February to November 1933, and, on the other, the questionnaire does not appear to have been sufficiently precise to prevent diverse interpretations. Moreover, it had been feared that the figures relating to the same category of freight, disbursements or receipts might not be homogeneous in each country and might in some cases be difficult to compare—and this was, in fact, the case. Lastly—and this was the chief difficulty—the more or less complete nature of the replies given by the administrations consulted, and, in some cases, by the transport companies concerned, depended on whether certain information was to be regarded as confidential or not.

For all these reasons, the information given in the following report can only be approximately correct, and, on some points of detail, it amounts to an interpretation. However, I have, in every case, inserted for reference purposes the figures contained in the replies from the members of the Committee or the administrations consulted in the form in which they were sent to me, even when I have been obliged to transpose them.

Tableau I. — Table I.

TRANSPORT AÉRIEN RÉGULIER DES COMPAGNIES SUBVENTIONNÉES.

REGULAR AIR TRAFFIC OF SUBSIDISED COMPANIES.

Quantités produites (1932). — *Quantities produced* (1932).

	Kilomètres	Passagers-km. Passenger-km.	Tonnes-kilomètres Ton-kilometres				
			Passagers Passengers	Messageries Goods	Poste Mails	Total	Coefficient d'utilisation % Coefficient of utilisation %
ALLEMAGNE — GERMANY : Deutsche Lufthansa (Europe). (A) (1)	7.003.718	24.630.175	1.970.400	1.026.972 *840.000*	*186.972*	2.997.372	42,5
AUTRICHE — AUSTRIA : « Oelag » (B) (1)	490.984	*1.719.732*	*137.600*	*19.400*	*3.871*	160.871	56
BELGIQUE — BELGIUM : « Sabena » (1)	1.140.380	2.093.240	167.440	78.893	15.075	261.408	22,5
ROYAUME-UNI — UNITED KINGDOM : (Réseau d'Europe et Londres-Egypte) (European and London-Egypt Lines) (1)	1.558.480	18.891.300	1.581.800	295.167	168.676	2.045.643	70
DANEMARK — DENMARK : D. D. L. (1)	244.470	678.925	54.320	15.238	8.930	78.488	42
ESPAGNE — SPAIN : L. A. P. E. (A) (1)	609.800	2.900.400	232.000	36.520 *18.000*	*18.520*	268.520	46
FINLANDE — FINLAND : « Aero O. Y. » . . . . . (C) (1)	257.440	609.310	48.720	14.040	10.157	72.917	56
FRANCE : (Réseau d'Europe) (European Network) . . . . . (1)	6.793.423	20.143.949	1.611.520	567.983	164.492	2.343.995	51
GRÈCE — GREECE : S. H. C. A. (E. E. E. S.) . . . . (2)	389.525	2.882.445	230.592	36.329	2.678	*269.299* (275.810 d'après réponse — according to reply)	66
HONGRIE — HUNGARY : « Malert » (1)	121.000	586.910	46.960	3.545	4.200	54.705	?
ITALIE — ITALY : (Réseau d'Europe) (European Network) . . . . . (1)	4.560.118	16.768.750	1.341.440	(avec bagages) 301.892 (including baggage)	(avec journaux) 138.806 (including newspapers)	1.782.338	41
PAYS-BAS — NETHERLANDS : K. L. M (Réseau d'Europe) (European Network) . . . . . (1)	1.271.623	5.071.988	405.760	237.669	47.396	690.825	47,2
POLOGNE — POLAND : P. L. L. « Lot » . . . . . (2)	1.187.684	2.859.879	228.800	86.612	10.463	325.875	40
ROUMANIE — ROUMANIA : L. A. R. E. S. . . . . (D) (1)	198.360	*370.000*	*29.520*	*6.450*	*20*	*36.000*	?
SUÈDE — SWEDEN : A. B. A. . . . (2)	411.661	1.951.000	156.080	55.490	41.835	253.405	60,5
SUISSE — SWITZERLAND : (Swissair) (Réseau international) (International Network) . . (A) (3)	670.436	2.012.845	161.024	37.195 *25.000*	*12.195*	198.219	39
TCHÉCOSLOVAQUIE CZECHOSLOVAKIA . . . . . (2)	940.451	2.073.807	165.604	74.690	4.139	244.433	31,3
YOUGOSLAVIE — YUGOSLAVIA . . . (1)	241.425	342.991	27.440	6.928	527	34.895	39
U.R.S.S. — U.S.S.R. : 1931 (« Deruluft ») . . . . . (B) (3)	981.000	*2.750.000*	*220.000*	*65.000*	*18.000*	302.940	50 env. approx.
Ensemble territorial considéré / Whole area considered . . .	29.071.978	*109.337.646*	*8.817.020*	*2.748.326*	*856.652*	*12.421.998*	

Les valeurs imprimées en italiques sont incertaines.

(1) D'après les renseignements transmis à la Société des Nations.
(2) D'après les statistiques publiées par la Commission internationale de Navigation aérienne (C. I. N. A.)
(3) De sources diverses ou d'après les compagnies intéressées.

(A) Décomposition arbitraire de l'ensemble (messageries + poste) en tonnes-kilomètres, seul communiqué.
(B) Distribution de la quantité totale de tonnes-kilomètres transportées (seule communiquée), en déterminant le parcours moyen, puis en l'appliquant aux diverses quantités de fret, également connues. A noter que l'Autriche ne compte comme bagages, dans ses statistiques de fret, que les excédents payants.
(C) La Finlande indique les quantités kilométriques produites par le seul fret payant.
(D) Estimation arbitraire du trafic kilométrique global, d'après longueur du réseau, longueur des étapes et quantités de fret ; décomposition de ce chiffre proportionnellement aux quantités de fret par catégorie.

Figures in italics are uncertain.

(1) According to information transmitted to the League of Nations.
(2) According to statistics published by the International Commission for Air Navigation (C. I. N. A.)
(3) From various sources or according to the companies concerned

(A) Arbitrary division of the total (goods + mails) in ton-kilometres, this being the only figure communicated.
(B) Division of the total quantity of ton-kilometres carried (the only figure communicated) by determining the average distance travelled and applying it to the different quantities of freight, which are also known. It should be noted that, in her freight statistics, Austria only includes as baggage the excess weight subject to charges.
(C) Finland gives the kilometric figures produced only by freight subject to charges.
(D) Arbitrary estimate of aggregate kilometric traffic, on the basis of the length of the system, the length of the stages and the quantities of freight ; division of this figure in proportion to the quantities of freight per category.

ENCAISSEMENT DES COMPAGNIES SUBVENTIONNÉES DE TRANSPORT AÉRIEN RÉGULIER.

REVENUE OF SUBSIDISED REGULAR AIR TRANSPORT COMPANIES.

Tableau II. — Année 1930. Table II. — Year 1930.

Pays	Compagnies	Recettes de clientèle provenant de : Receipts from Customers derived from : — Passagers Passengers — en monnaie nationale in national currency	Passagers — en francs français in French francs	Messageries et bagages Goods and baggage — en monnaie nationale in national currency	Messageries et bagages — en francs français in French francs	Poste Mails — en monnaie nationale in national currency	Poste — en francs français in French francs	Recettes totales de clientèle Total Receipts from Customers — en monnaie nationale in national currency	Recettes totales — en francs français in French francs	Subventions et forfaits Subsidies and Lump Sum Payments — en monnaie nationale in national currency	Subventions — en francs français in French francs	Encaissement global de l'année Aggregate Annual Revenue — en monnaie nationale in national currency	Encaissement global — en francs français in French francs	Valeur de change au 1/X/30 Exchange value on 1/X/30	Indice Recette de clientèle / Subvention = P_1	Indice Recette de clientèle / Encaissement global = P_2	Indice Subvention / Encaissement global = P_3	Companies	Country
															%	%	%		
Allemagne (1)	Deutsche Lufthansa.	*4.000.000 RM.*	*24.240.000*	*1.800.000 RM.*	*10.908.000*	*1.600.000 RM.*	*9.696.000*	9.240.000 RM. (2)	55.994.400	16.000.000 RM.	96.960.000	25.240.000 RM.	152.954.400	6,06	57,7	36,6	63,3	Deutsche Lufthansa.	Germany (1).
Autriche	« Oelag ».	462.002 S.	1.663.207	50.546 S.	181.965	20.206 S.	72.738	532.754 S.	1.917.915	2.117.250 S.	7.622.100	2.650.004. S.	9.540.015	360	25,1	20,1	79,8	" Oelag ".	Austria.
Belgique	« Sabena ».	107.406 f. b.	2.206.260	1.068.174 f. b.	759.470	167.032 f. b.	118.760	4.342.612 f. b.	3.087.595	22.873.998 f. b.	16.263.410	27.216.610 f. b.	19.351.005	71,10	18,9	15,9	84	" Sabena ".	Belgium.
Royaume-Uni (2)	Imperial Airways.	?	?	?	?	?	?	*£100.000*	*12.383.000*	*£225 000*	*27.861.750*	*£325.000*	*40.244.750*	123,83	*44,4*	*30,7*	*69,2*	Imperial Airways.	United Kingdom (2).
Danemark (3)	D. D. L.	88.518 c. d.	601.920	14.701 c. d.	100.040	26.004 c. d.	176.955	129.223 c. d.	879.360	350.000 c. d.	2.381.750	479.223 c. d.	3.261.110	680,50	36,9	26,9	73	D.D.L.	Denmark (3).
Espagne (4)	L. A. P. E.	549.700 pes.	1.453.955	53.202 pes.	100.720	1.036 pes.	2.740	603.938 pes.	1.597.415	3.000.000 pes.	7.935.000	3.603.938 pes.	9.532.415	264,50	20,1	16,7	83,2	L.A.P.E.	Spain (4).
Finlande	« Aero O. Y. ».	1.144.864 m. f.	735.000	86.592 m. f.	55.600	614.757 m. f.	394.675	1.846.213 m. f.	1.185.270	2.059.735 m. f.	1.322.350	3.905.948 m. f.	2.507.620	64,25	89,6	47,2	52,7	" Aero O.Y. ".	Finland.
France (5)	Cinq compagnies.	12.610.950 f. f.	12.610.950	10.266.197 f. f.	10.266.197	6.718.761 f. f.	6.718.761	30.622.083 f. f. (5)	30.622.083	119.800.000 f. f.	119.800.000	150.422.083 f. f.	150.422.083	—	25,5	20,3	79,6	Five companies.	France (5).
Grèce (6)	S.H.C.A. (E.E.E.S.).	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	S.H.C.A. (E.E.E.S.).	Greece (6).
Hongrie	« Malert ».	114.327 pengö	508.755	15.208 pengö	67.675	1.363 pengö	6.065	130.898 pengö	582.496	200.000 pengö	890.000	330.898 pengö	1.472.496	—	65,5	39,5	60,4	" Malert ".	Hungary.
Italie (7)	Lignes réseau principal.	1.275.299 l.	1.701.250	95.357 l.	127.205	50.710 l.	67.650	1.421.366 l.	1.896.102	38.126.472 l.	50.860.713	68.993.210 l. (7)	91.690.200	133,40	—	—	—	Lines of main system.	Italy (7).
Pays-Bas	K. L. M.	483.130 fl.	4.966.575	271.798 fl.	2.794.085	73.354 fl.	754.080	828.282 fl.	8.514.740	861.812 fl.	8.859.425	1.690.094 fl.	17.374.165	1.028	96,1	49	50,9	K.L.M.	Netherlands.
Pologne	P. L. L. « Lot ».	383.792 zl.	1.095.725	142.040 zl.	405.525	22.638 zl.	64.630	548.470 zl.	1.565.880	4.565.783 zl.	13.035.310	5.114.253 zl.	14.601.190	285,50	12	10,7	89,2	P.L.L. " Lot ".	Poland.
Roumanie	L. A. R. E. S.	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	L.A.R.E.S.	Roumania.
Suède (8)	A. B. A.	212.003 c. s.	1.451.160	40.945 c. s.	278.630	103.057 c. s.	701.300	356.005 c. s.	2.436.855	596.760 c. s.	4.084.820	952.765 c.s. (8)	6.521.675	684,50	59,6	37,3	62,6	A.B.A.	Sweden (8).
Suisse (9)	Swissair.	275.452 f. s.	1.362.660	40.292 f. s.	199.325	Néant (9) Nil		315.744 f. s.	1.561.985	1.162.068 f. s.	5.748.750	1.477.812 f. s.	7.310.735	494,75	27,1	21,3	78,6	Swissair (in 1932).	Switzerland (9).
Tchécoslovaquie	C. S. A. et C. L. S.	*1.300.000 c. t.*	982.800	*450.000 c. t.*	*340.200*	*60.000 c. t.*	*45.360*	1.812.998 c. t.	1.370.625	13.324.520 c. t.	10.073.335	15.137.518 c. t.	11.443.960	75,60	13,6	11,9	88	C.S.A. and C.L.S.	Czechoslovakia.
Yougoslavie	Aeroput.	924.193 din.	415.715	127.593 din.	56.780	17.813 din.	7.925	1.069.598 din.	475.970	6.646.644 din.	2.957.755	7.716.242 din.	3.433.725	44,50	16	13,8	86,1	Aeroput.	Yougoslavia.
Allemagne et U. R. S. S.	Deruluft.	(avec messageries — including goods 246.644 RM.)	1.494.660	(compté avec recettes passagers) (included in passenger receipts)		232.646 RM.	1.409.835	479.290 RM.	2.904.495	1.614.026 RM.	9.780.995	2.093.316 RM.	12.685.490	6,06	29,6	22,8	77,1	Deruluft	Germany and U.S.S.R.
		Total	57.490.592	Total	26.681.417	Total	20.237.474	Total	128.976.186	Total	385.437.463	Total	561.906.434						

Tableau III. — Année 1931. Table III. — Year 1931.

Allemagne (1)	Deutsche Lufthansa.	*3.800.000 RM.*	*23.180.000*	*1.700.000 RM.*	*10.370.000*	*1.600.000 RM.*	*9.760.000*	7.100.000 RM.	43.310.000	15.800.000 RM.	96.380.000	22.900.000 RM.	139.690.000	6,10	44,9	31	68,9	Deutsche Lufthansa.	Germany (1).
Autriche	« Oelag ».	447.990 S.	1.612.765	51.830 S.	186.590	16.939 S.	60.980	516.759 S.	1.860.330	2.087.000 S.	7.513.200	2.603.759 S.	9.373.530	360	24,7	19,8	80,1	" Oelag ".	Austria.
Belgique	« Sabena ».	3.340.979 f. b.	2.372.095	1.344.155 f. b.	954.350	292.025 f. b.	207.340	4.977.159 f. b.	3.533.780	24.437.794 f. b.	17.350.835	29.414.953 f. b.	20.884.615	71,069	20,3	16,9	83	" Sabena ".	Belgium.
Royaume-Uni (2)	Imperial Airways.	*£102.000*	*10.082.700*	*£28.000*	*2.767.800*	*£80.000*	*7.908.000*	*£210.000*	*20.758.500*	£200.000	19.770.000	*£410.000*	*40.528.900*	98,854	*105*	*51,2*	*48,8*	Imperial Airways.	United Kingdom (2).
Danemark (3)	D. D. L.	93.259 c. d.	521.040	15.744 c. d.	87.960	50.422 c. d.	281.705	159.425 c. d.	890.705	350.000 c. d.	1.955.450	509.425 c. d.	2.846.155	558,708	45,5	31,2	68,7	D.D.L.	Denmark (3).
Espagne (4)	L. A. P. E.	535.400 pes.	1.216.965	72.000 pes.	163.655	920 pes.	2.090	598.320 pes.	1.359.980	3.450.000 pes.	7.841.850	4.048.320 pes.	9.201.830	227,385	17,3	14,7	85,2	L.A.P.E.	Spain (4).
Finlande	« Aero O. Y. ».	1.295.272 m. f.	663.180	121.693 m. f.	62.305	1.138.665 m. f.	582.995	2.555.631 m. f.	1.308.485	2.037.400 m. f.	1.043.150	4.593.031 m. f.	2.351.635	51,25	125,4	55,6	44,3	" Aero O.Y. ".	Finland.
France (5)	Cinq compagnies.	11.794.980 f. f.	11.794.980	9.719.991 f. f.	9.719.991	6.658.537 f. f.	6.658.537	29.673.508 f.f. (5)	29.673.508	133.444.115 f. f.	133.444.115	163.117.623 f. f.	163.117.623	—	22,2	18,1	81,8	Five companies.	France (5).
Grèce (6)	S.H.C.A. (E.E.E.S.).	1.185.692 dr.	393.650	54.817 dr.	18.200	79.000 dr.	26.230	1.319.509 dr.	438.075	8.172.943 dr.	2.713.415	9.492.452 dr.	3.151.490	33,25	16,1	13,9	86	S.H.C.A. (E.E.E.S.).	Greece (6).
Hongrie	« Malert ».	95.342 pengö	424.271	15.285 pengö	68.018	2.271 pengö	10.105	116.898 pengö	521.205	200.000 pengö	890.000	316.898 pengö	1.411.205	445	58,5	36,8	63,2	" Malert ".	Hungary.
Italie (7)	Lignes réseau principal.	1.356.663 l.	1.773.160	115.260 l.	150.645	82.928 l.	108.385	1.554.851 l.	2.032.190	34.649.248 l.	45.286.567	67.119.376 l. (7)	87.321.000	130,763	—	—	—	Lines of main system	Italy (7).
Pays-Bas	K. L. M.	529.027 fl.	5.433.635	352.559 fl.	3.621.135	73.659 fl.	756.558	955.245 fl.	9.811.320	646.177 fl.	6.636.885	1.601.422 fl.	16.448.205	1.027,10	147,8	59,6	40,4	K.L.M.	Netherlands.
Pologne	P. L. L. « Lot ».	402.395 zl.	1.143.605	127.335 zl.	361.885	24.565 zl.	69.815	554.295 zl.	1.575.305	4.860.000 zl.	13.812.120	5.414.295 zl.	15.387.425	284,25	11,4	10,2	89,7	P.L.L. " Lot ".	Poland.
Roumanie	L. A. R. E. S.	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	L.A.R.E.S.	Roumania.
Suède (8)	A. B. A.	148.481 c. s.	875.445	42.218 c. s.	248.915	136.709 c. s.	806.035	327.408 c. s.	1.930.395	632.530 c. s. (8)	3.729.395	959.938 c. s.	5.659.790	589,685	51,7	34,1	65,8	A.B.A.	Sweden (8).
Suisse (9)	Swissair.	301.128 f. s.	1.497.510	42.155 f. s.	209.635	Néant (9) Nil		343.283 f. s.	1.707.145	1.516.522 f. s.	7.541.665	1.859.805 f. s.	9.248.810	497,341	22,6	18,4	81,5	Swissair.	Switzerland (9).
Tchécoslovaquie	C. S. A. et C. L. S.	*1.300.000 c. t.*	*977.600*	*600.000 c. t.*	*451.200*	*120.000 c. t.*	*90.240*	2.019.434 c. t.	1.518.615	17.017.974 *c. t.*	12.797.515	19.037.408 c. t.	14.316.130	75,21	11,8	10,6	89,3	C.S.A. and C.L.S.	Czechoslovakia.
Yougoslavie	Aeroput.	850.733 din.	382.830	125.780 din.	56.600	18.510 din.	8.330	995.023 din.	447.760	7.531.631 din.	3.389.235	8.526.654 din.	3.836.995	45,07	13,2	11,6	88,3	Aeroput.	Yougoslavia.
Allemagne et U. R. S. S.	Deruluft.	(avec messageries — including goods 331.607 RM.)	2.022.800	(avec passagers — including passengers 331.607 RM.)		248.734 RM.	1.517.275	580.341 RM.	3.540.080	1.597.929 RM.	9.747.365	2.178.270 RM.	13.287.445	6,10	36,3	26,6	73,3	Deruluft.	Germany and U.S.S.R.
		Total	66.368.231	Total	29.498.884	Total	28.854.612	Total	126.217.378	Total	391.842.762	Total	560.188.383						

Tableau IV. — Année 1932. Table IV. — Year 1932.

Allemagne (1)	Deutsche Lufthansa.	*3.200.000 RM.*	*19.328.000*	*1.300.000 RM.*	*7.852.000*	*1.500.000 RM.*	*9.060.000*	6.083.124 RM. (1)	36.742.070	14.100.000 RM. (1)	85.164.000	20.183.124 RM.	121.906.070	6,04	43,1	30,1	69,8	Deutsche Lufthansa.	Germany (1).
Autriche	« Oelag ».	396.742 S.	1.428.270	32.097 S.	115.550	17.553 S.	63.190	446.392 S.	1.607.010	1.530.000 S.	5.508.000	1.976.392 S.	7.115.010	360	29,1	22,5	77,4	" Oelag ".	Austria.
Belgique (1 *bis*)	« Sabena ».	*3.230.778 f. b.*	*2.284.160*	*1.009.980 f. b.*	*714.055*	*223.227 f. b.*	*157.820*	5.824.470 f. b.	4.135.048	16.218.522 f. b.	11.516.200	22.042.992 f. b.	15.650.530	70,78	36	26,5	73,5	" Sabena ".	Belgium (1 *a*).
Royaume-Uni (2)	Imperial Airways.	*£240.000*	*20.800.800*	*£30.000*	*2.600.100*	*£90.000*	*7.800.300*	*£360.000*	*31.201.200*	£200.000	17.334.000	*£560.000*	*48.535.200*	86,67	*180*	*64,2*	35,7	Imperial Airways.	United Kingdom (2).
Danemark (3)	D. D. L.	?	?	?	?	?	?	*150.000 c. d.*	673.950	350.000 c. d.	1.572.550	500.000 c. d.	2.246.500	449,33	42,8	30	70	D.D.L.	Denmark (3).
Espagne (4)	L. A. P. E.	500.100 pes.	1.043.210	65.325 pes.	136.265	Néant (4) Nil		*603.125 pes.*	*1.258.120*	3.450.000 pes.	7.196.700	*4.053.125 pes.*	*8.454.820*	208,63	*17,4*	*14,8*	*85,1*	L.A.P.E.	Spain (4).
Finlande	« Aero O. Y. ».	1.599.287 m. f.	594.935	149.042 m. f.	55.445	1.352.375 m. f	503.085	3.100.704 m. f.	1.153.460	1.943.930 m. f.	723.140	5.044.634 m. f.	1.876.600	37,25	159,5	61,4	38,5	" Aero O.Y. ".	Finland.
France (5)	Cinq compagnies.	14.214.225 f. f.	14.214.225	8.951.669 f. f.	8.951.669	7.305.807 f. f.	7.305.807	31.971.701 f.f. (5)	31.971.701	124.829.625 f. f.	124.829.625	156.801.326 f. f.	156.801.326	—	25,6	20,3	79,6	Five companies.	France (5).
Grèce (6)	S.H.C.A. (E.E.E.S.).	1.869.274 dr.	620.600	184.935 dr.	61.400	174.000 dr.	57.770	6.428.209 dr. (6)	2.134.165	18.000.000 dr. (6)	5.976.000	24.428.209 dr.	8.110.165	33,25	35,7	26,3	73,6	S.H.C.A. (E.E.E.S).	Greece (6).
Hongrie	Malert ».	73.461 pengö	326.901	8.581 pengö	38.185	2.550 pengö	11.347	84.592 pengö	376.434	200.000 pengö	890.000	284.592 pengö	1.266.434	445	42,3	29,9	70,1	" Malert ".	Hungary.
Italie (7)	Lignes réseau principal.	2.558.468 l.	3.333.685	237.927 l.	310.020	78.401 l.	102.155	2.874.796 l.	3.745.860	42.929.801 l.	55.937.530	79.223.5381. (7)	102.991.200	130,39	—	—	—	Lines of main system.	Italy (7).
Pays-Bas	K. L. M.	505.854 fl.	5.182.980	266.681 fl.	2.732.415	127.582 fl.	1.307.205	900.117 fl.	9.222.600	628.044 fl.	6.434.940	1.528.161 fl.	15.657.540	1.024,6	*143,3*	*58,9*	41	K.L.M.	Netherlands.
Pologne	P. L. L. « Lot ».	327.832 zl.	936.290	75.074 zl.	214.411	17.805 zl.	50.850	420.710 zl.	1.201.545	5.312.000 zl.	15.171.070	5.732.710 zl.	16.372.615	285,66	7,9	7,3	92,6	P.L.L. " Lot ".	Poland.
Roumanie	L. A. R. E. S.	?	?	?	?	?	?	559.522 lei	84.485	8.590.000 lei	1.297.090	9.149.522 lei	1.381.575	15,19	6,5	6,1	93,8	L.A.R.E.S.	Roumania.
Suède (8)	A. B. A.	355.000 c. s.	1.589.690	56.000 c. s.	250.770	170.000 c. s.	761.260	581.000 c. s. (8)	2.601.720	1.257.000 c. s.	5.628.845	1.838.000 c. s.	8.230.565	447,80	46,2	31,6	68,3	A.B.A.	Sweden (8).
Suisse (9)	Swissair.	310.620 f. s.	1.527.320	36.607 f. s.	179.995	Néant (9) Nil		347.230 f. s.	1.707.330	1.474.504 f. s.	7.250.135	1.821.733 f. s.	8.957.465	491,7	23,5	19	80,9	Swissair.	Switzerland (9).
Tchécoslovaquie	C. S. A. et C. L. S.	1.197.907 c. t.	903.220	492.652 c. t.	371.460	58.590 c. t.	44.175	1.749.149 c. t.	1.318.860	13.801.510 c. t.	10.406.340	15.550.659 c. t.	11.725.200	75,48	12,6	11,2	88,7	C.S.A. and C.L.S	Czechoslovakia.
Yougoslavie	Aeroput.	487.029 din.	219.165	108.492 din.	48.820	47.386 din.	21.325	642.907 din.	289.308	6.276.573 din.	2.824.455	6.919.480 din.	3.113.763	45	10,2	9,2	90,7	Aeroput.	Yougoslavia.
Allemagne et U. R. S. S.	Deruluft.	(avec messageries — including goods 356.641 RM.)	2.154.110	(compté avec recettes passagers) included in passenger receipts)		262.624 RM.	1.586.250	618.965 RM.	3.738.550	1.851.395 RM.	11.182.425	2.470.360 RM.	14.920.975	6,04	33,4	25	74,9	Deruluft.	Germany and U.S.S.R.
		Total	*76.487.561*	Total	*24.632.560*	Total	*28.832.539*	Total	135.163.408	Total	376.843.045	Total	555.313.103		Indices-pourcentages d'appréciation Approximate percentage-indices				

Les valeurs en italiques sont incertaines.

Figures in italics are uncertain.

OBSERVATIONS ET NOTES.

(1) **Allemagne.** — Le membre allemand a indiqué que les recettes commerciales de la *Deutsche Lufthansa* « atteignent environ 40% des recettes totales », mais n'a communiqué aucun chiffre de recettes commerciales. Ceux qui figurent dans ce tableau ont été empruntés aux « Geschäftsberichte » de la *Deutsche Lufthansa*, sous réserve d'une réduction de 15% environ. En effet, en 1932, dans 7.375.460 RM. de recettes, le « produit des vols » a compté pour 6.083.124 RM., soit 85% environ. C'est ce chiffre qui a donc été porté pour 1932 et, pour 1930 et 1931, on a pratiqué la réduction de 15% sur le poste « Einnahmen » des « Geschäftsberichte ». L'estimation ainsi obtenue est un peu optimiste, car il faudrait en déduire les recettes — assez faibles — des services extraeuropéens (8 à 10% du kilométrage total et peut-être 5% des recettes commerciales). En résumé, le rapport des recettes de clientèle aux subventions est de 40% environ, mais la part des recettes de clientèle dans les recettes totales de trafic (recettes de clientèle + subventions) est de 28 à 30%.

Enfin, le chiffre global de « recettes de clientèle » trouvé pour 1930 apparaît très élevé et comprend sans doute certains encaissements exceptionnels; de toute façon, étant donné les quantités de fret produites et les tarifs alors appliqués, il n'a pas paru possible de distribuer la totalité de cette somme entre les trois catégories de recettes ; au lieu de 9.240.000 RM., c'est 7.400.000 RM. qu'on a adoptés pour cette répartition arbitraire.

(1 *bis*) Le Gouvernement belge ayant communiqué un chiffre global nouveau pour la recette commerciale de 1932, on a calculé d'après ce chiffre les valeurs des colonnes ultérieures qui en étaient affectées.

(2) **Royaume-Uni.** — L'estimation des recettes de clientèle obtenues par les *Imperial Airways* est arbitraire ; encore n'a-t-elle été possible, dans des limites d'erreur acceptables, que pour 1931 et 1932. Les seuls chiffres officiels, dont on a disposé, sont relatifs aux encaissements globaux (subventions + recettes de clientèle) pour l'ensemble du réseau à travers le monde.

Toutefois, à partir de ces valeurs, on peut, connaissant les subventions, dégager la recette de clientèle globale. On considère ensuite, d'une part, les quantités kilométriques produites et utilisées sur chaque ligne ; d'autre part, connaissant les tarifs pratiqués et déduisant une certaine proportion pour les transports gratuits et à prix réduit, le rapport probable de la tonne-kilomètre suivant qu'elle consiste en passagers, messageries ou poste. On applique aux frets annuels du réseau d'Europe, puis de la ligne Londres-Egypte, les taux dégagés. Il est d'ailleurs probable qu'on a surestimé les recettes postales, faute de connaître le détail des accords de paiement intervenus entre la Compagnie et le Post Office.

(3) **Danemark.** — Pour 1931 et 1932, on a compté comme recettes postales, faute d'en connaître la décomposition rigoureuse, les recettes de la ligne postale de nuit ; en réalité, un dixième environ de ces recettes provient de messageries.

(4) **Espagne.** — A partir de 1932, le courrier est transporté sans surtaxe. Les recettes données pour 1932 concernent les onze premiers mois seulement ; on a donc majoré *le total* d'un quinzième.

(5) **France.** — Le chevauchement irrégulier des exercices budgétaires interdit d'inscrire des recettes qui correspondent rigoureusement aux années de calendrier. En outre, on pourra noter que, chaque année, la recette totale de trafic indiquée est supérieure à la somme des éléments portés dans les trois colonnes précédentes ; en effet, on y a ajouté les recettes de la ligne Marseille-Beyrouth, qui n'étaient données que globalement et qui, pour 1930, étaient égales à 1.026.175 francs. Pour 1931 et 1932, les recettes de ce tronçon n'étaient pas discernables de celles de la ligne Marseille-Saïgon tout entière et on les a comptées arbitrairement pour 1.500.000 francs.

(6) **Grèce.** — Pour évaluer les recettes de trafic de l'exercice 1932, on a d'abord porté pour leur valeur les recettes de la période 1er janvier-9 juillet, l'exercice budgétaire étant clos à cette date ; puis on y a ajouté 75% des recettes de la période 10 juillet 1932-15 mars 1933. On a admis une approximation analogue pour estimer les subventions de 1932.

(7) **Italie.** — Le membre italien du Comité a communiqué les recettes et les subventions des seules lignes incluses dans le projet de réseau principal; ces ont ces chiffres qui figurent, pour chaque année, dans toutes les colonnes, sauf la dernière, où figure vraiment l'« encaissement global de l'année ».

(8) **Suède.** — Les recettes de 1932 sont approximatives. En outre, on ignore, pour 1930 et 1931, si la Cie A. B. A. a bénéficié d'un paiement postal forfaitaire analogue à celui qui, pour 1932, s'est élevé à 500.000 couronnes.

(9) **Suisse.** — Il n'y a pas de recettes postales, ce transport faisant l'objet d'un paiement forfaitaire, à caractère de subvention, dont on a déduit le produit des surtaxes. A noter que la réponse suisse incorpore aux recettes de passagers le produit des excédents de bagages, ce qui est particulièrement logique.

OBSERVATIONS AND NOTES.

(1) **Germany.**—The German member has stated that "the commercial receipts of the *Deutsche Lufthansa* amount to about 40 per cent of the total revenue ", but has not given any figure for commercial receipts. Those which appear in this table have been taken from the management reports (" Geschäftsberichte ") of the *Deutsche Lufthansa*, making a reduction of about 15 per cent. In fact, in 1932, out of 7,375,460 RM. of receipts, those derived from flights amounted to 6,083,124 RM.—that is to say, approximately 85 per cent. This figure has therefore been shown for 1932 and, in the case of 1930-31, a reduction of 15 per cent has been made on the item " Receipts " in the management reports (" Geschäftsberichte "). The estimate thus obtained is somewhat optimistic, for we should deduct from it the receipts—which are not very large—for services outside Europe (8 to 10 per cent of the total distance in kilometres and perhaps 5 per cent of the commercial receipts). To sum up, the proportion of receipts from customers to subsidies is approximately 40 per cent, but the share of receipts from customers in the total receipts from traffic (receipts from customers plus subsidies) is from 28 to 30 per cent. Lastly, the total figure for " Receipts from customers " which has been established for 1930 appears very high and doubtless includes certain extraordinary revenue; in any case, in view of the amount of goods offered for carriage and the tariffs then in force, it does not seem possible to apportion the whole of this sum between the three categories of receipts ; instead of 9,240,000 RM., 7,400,000 RM. has been taken for the purposes of this arbitrary apportionment.

(1*a*) The Belgian Government having communicated a new total of commercial revenue for 1932, this was taken as a basis for computing the figures of the succeeding columns affected thereby.

(2) **United Kingdom.**—The estimate of the receipts from customers of *Imperial Airways* was arbitrary; as yet, it has only been possible to make a sufficiently approximate estimate for 1931-32. The only official figures available concern the total receipts (subsidies plus receipts from customers) for the whole Imperial Airways system through the world.

Nevertheless, taking these figures and knowing the amount of subsidies, it is possible to arrive at the total receipts from customers. We then take the kilometric quantities produced and used on each line and, knowing the tariffs in force and deducting a certain percentage for traffic carried free or at reduced rates, one can estimate the probable proportion of ton-kilometres, whether passengers, goods or mails. We then apply the proportion thus obtained to the annual goods traffic on the European system and then to that of the London-Egypt line. It is furthermore probable that mails traffic has been over-estimated, as it was not possible to know the details of the agreements for payment concluded between the Company and the Post Office.

(3) **Denmark.**—In the case of 1931 and 1932, when estimating postal receipts, not being able to know exactly how they should be apportioned, the receipts of the night postal service have been taken ; in practice, about a tenth of these receipts are derived from goods traffic.

(4) **Spain.**—Since 1932, mail has been carried without any extra charge. The receipts for 1932 apply only to the first eleven months; the total has therefore been increased by one-fifteenth.

(5) **France.**—The fact that the financial years for budget purposes are irregular from the normal point of view has not made it possible to put down receipts which strictly correspond with calendar years. Furthermore, it may be noted that every year the total traffic receipts shown are higher than the sum of the figures in the three previous columns added together; in fact, the receipts of the Marseilles-Beirut line, which were only given as a whole, were added in, and in 1930 they amounted to 1,026,175 francs. For 1931 and 1932, the receipts of this line could not be distinguished from those of the whole Marseilles-Saigon line, and they were arbitrarily estimated at 1,500,000 francs.

(6) **Greece.**—In order to estimate the traffic receipts for the financial year 1932, we first took the amount of the receipts for the period January 1st-July 9th, as the budgetary year closed at that date. We then added 75 per cent of the receipts for the period July 10th, 1932-March 15th, 1933. A similar approximation was adopted for the purpose of estimating the subsidies for 1932.

(7) **Italy.**—The Italian member of the Committee only communicated the receipts and subsidies of the lines which were included in the scheme for a main network ; these were the figures which appear for each year in all the columns save the last, which actually shows " Total receipts for the year ".

(8) **Sweden.**—The receipts for 1932 are an approximate estimate. Furthermore, it is not known whether in the years 1930 and 1931 the A.B.A. Company received a lump sum as payment for mails traffic similar to that for 1932, which amounted to 500,000 crowns.

(9) **Switzerland.**—There are no receipts from postal traffic, as a lump sum is paid for this traffic as a subsidy from which revenue from extra charges has been deducted. It should be noted that the Swiss reply includes excess luggage receipts in " receipts from passenger traffic ", which is very logical.

CHAPTER I.

TRAFFIC RESULTS OBTAINED IN EUROPE FROM 1930 TO 1932 INCLUSIVE BY THE CONTRACTUAL AIR TRANSPORT COMPANIES.

By the term " Europe " is meant the land and sea area taken into consideration by the Sub-Committee in studying the " permanent network ". This restriction has, in several cases, made it necessary to split up certain traffic results and include only a part thereof in our tables or graphs. The uncertain figure in respect of these results is printed in italics, its source being indicated, in the table or graph.

As a whole, it has been possible to calculate accurately the traffic results in kilometric tons per category of freight for 1932. These figures, which have been summarised in *Table I*, have served as a basis for my interpretation of the development of the traffic in quantities. (See *Table I* attached.)

As regards the financial results (subsidies and receipts from customers), the replies received were usually very complete and very definite. Unfortunately, Germany gave only the approximate total for subsidies and a percentage of that figure for receipts from customers, which I have endeavoured to analyse more fully. The United Kingdom gave the exact amounts of the aggregate subsidies, but was only able to furnish the total (subsidies plus traffic receipts) for European or long-distance lines as a whole. Lastly, Italy, which supplied the particulars requested in greater detail, only did so as regards the lines of her system coinciding with the lines included in the " main network " studied by the Sub-Committee. Therefore, in the case of three out of the four countries which, from the point of view of the quantities of traffic produced in the network under consideration, are of much greater importance than all the rest, the data at the disposal of the Rapporteur were uncertain.

In any case, the financial results are dealt with in the three *Tables II, III, IV* (see inside of folder opposite), each covering one year. In compiling these documents, the two values of each amount, in national currency and in French francs, have been placed side by side, with a view to the insertion of a comparable total for each category of receipts. (Exchange value : October of the year under review [1] ; see *Recapitulatory Table V.*)

Lastly, on the basis (1) of the quantities of freight (produced and utilised) in kilometric tons and (2) of the revenue of the companies (subsidies and receipts from customers) in French francs, the trend of these results, from 1930 to 1932 inclusive, has been indicated in *Graphs* 1 and 2.

Approximate, and sometimes even conjectural, values are given in too many cases in these documents. I shall be pleased to receive corrected figures from the authorities concerned. Nevertheless, even as they stand, these estimates and values represent (with a very tolerable coefficient of error) *facts which it had hitherto been impossible to compare properly.*

[1] The Italian Government has rightly pointed out that, if the annual average exchange rate is adopted, a more reliable—even though the difference is very slight—factor of comparison is obtained. I have not thought it necessary to recalculate each figure in *Table II* for the final edition of the Report.

The Rapporteur therefore draws the Sub-Committee's special attention to *Graphs 1 and 2*. The necessary explanations accompany each graph.

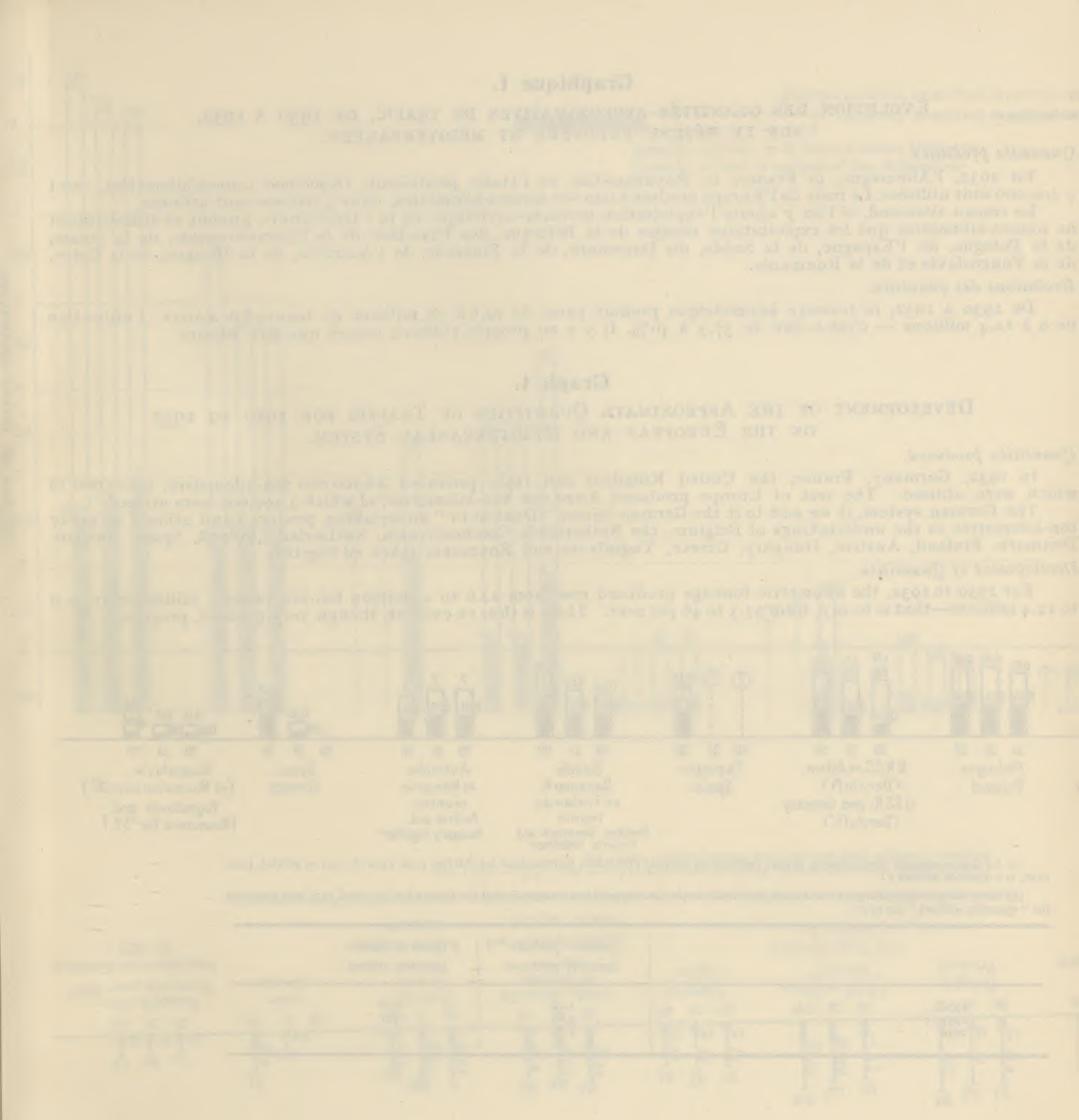
* * *

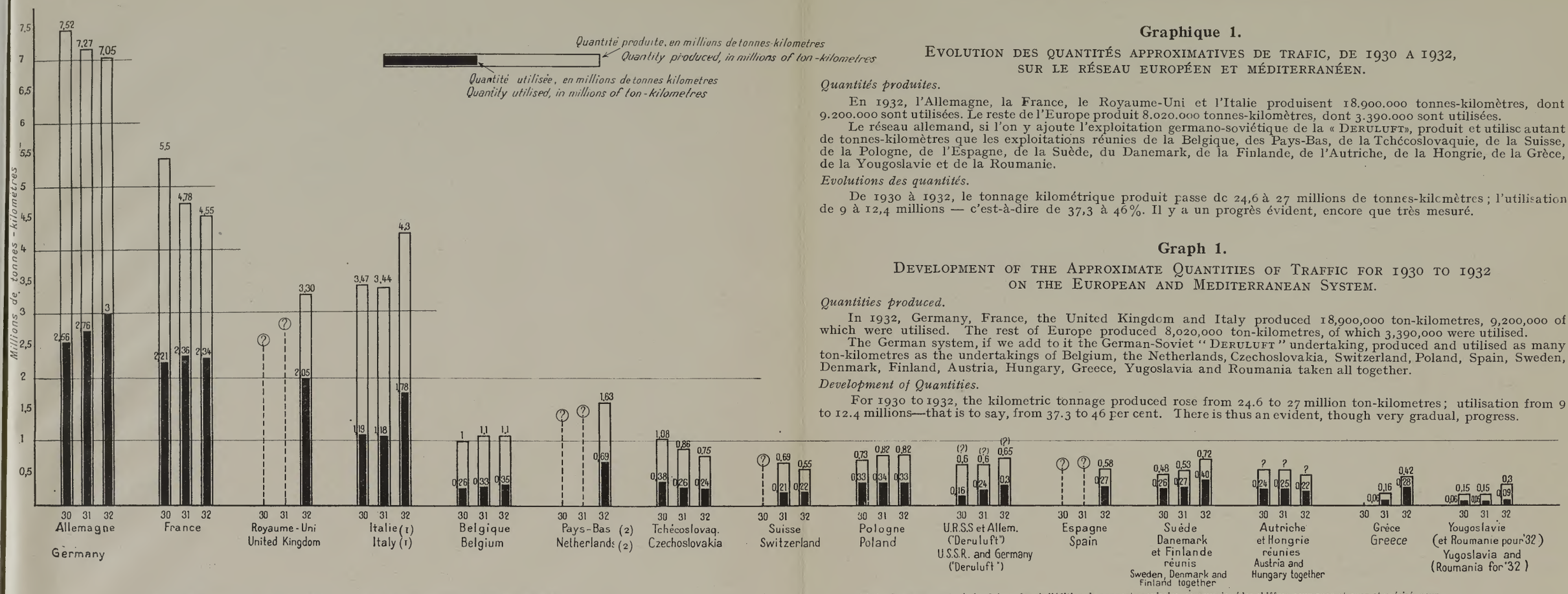
Table V.

EXCHANGE VALUES ADOPTED.

Pays	Monnaie nationale et abréviation adoptée National currency and abbreviation adopted		Quantité correspondant à 100 francs français Amount corresponding to 100 French francs				Country
			Parité-or Gold parity	Octobre 1930 October 1930	Octobre 1931 October 1931	Octobre 1932 October 1932	
ALLEMAGNE . .	Reichsmark (RM)	100	608,01	606,50	610	610	GERMANY.
AUTRICHE . . .	Schilling (S)	100	359,15	360	360		AUSTRIA.
BELGIQUE . . .	Franc belge / Belgian franc (f. b.)	100		71,10	71,069	70,783	BELGIUM.
ROYAUME-UNI .	Livre sterling / Pound sterling (£)	1	124,21	123,83	98,854	86,6728	UNITED KINGDOM.
DANEMARK . .	Couronne danoise / Danish crown (c. d.)	100	684,02	680,50	558,708	449,333	DENMARK.
ESPAGNE . . .	Peseta (pes.)	100	492,49	264,50	227,385	208,639	SPAIN.
FINLANDE . . .	Mark finlandais / Finnish mark (m. f.)	100	64,28	64,25	51,25	37,25	FINLAND.
FRANCE	Franc français / French franc (f. f.)		Monnaie de base Standard currency				FRANCE.
GRÈCE	Drachme / Drachma (dr.)	100	33,12	33,25	33,25	33,25	GREECE.
HONGRIE . . .	Pengö (P.)	100	446,41		445		HUNGARY.
ITALIE	Lire / Lira (l.)	100	134,34	133,40	130,763	130,397	ITALY.
NORVÈGE . . .	Couronne norvégienne / Norwegian crown (c.n.)	100	684,02	680,50	560,812	437,714	NORWAY.
PAYS-BAS . . .	Florin (fl.)	100	1.025,95	1.028	1.027,10	1.024,60	NETHERLANDS.
POLOGNE . . .	Zloty (zl.)	100	286,33	285,50	284,25	285,666	POLAND.
ROUMANIE . .	Lei (lei)	100	15,27	15,15	15,155	15,19	ROUMANIA.
SUÈDE	Couronne suédoise / Swedish crown (c. s.)	100	684,02	684,50	589,685	447,80	SWEDEN.
SUISSE	Franc suisse / Swiss franc (f. s.)	100	492,49	494,75	497,341	491,704	SWITZERLAND.
TCHÉCOSLOVAQUIE	Couronne tchécoslov. / Czechoslovak crown (c.t.)	100	75,62	75,60	75,21	75,483	CZECHOSLOVAKIA.
YOUGOSLAVIE .	Dinar (din.)	100	44,95	44,50	45,07		YUGOSLAVIA.

Tables II, III and *IV* have also served as a basis for a second task, the determination of indices showing, in the form of a percentage, the extent to which the enterprise is becoming independent of State subsidies. The *index percentages* P_1, P_2,





Graphique 1.

Evolution des quantités approximatives de trafic, de 1930 a 1932, sur le réseau européen et méditerranéen.

Quantités produites.

En 1932, l'Allemagne, la France, le Royaume-Uni et l'Italie produisent 18.900.000 tonnes-kilomètres, dont 9.200.000 sont utilisées. Le reste de l'Europe produit 8.020.000 tonnes-kilomètres, dont 3.390.000 sont utilisées.

Le réseau allemand, si l'on y ajoute l'exploitation germano-soviétique de la « Deruluft », produit et utilise autant de tonnes-kilomètres que les exploitations réunies de la Belgique, des Pays-Bas, de la Tchécoslovaquie, de la Suisse, de la Pologne, de l'Espagne, de la Suède, du Danemark, de la Finlande, de l'Autriche, de la Hongrie, de la Grèce, de la Yougoslavie et de la Roumanie.

Evolutions des quantités.

De 1930 à 1932, le tonnage kilométrique produit passe dc 24,6 à 27 millions de tonnes-kilomètres ; l'utilisation de 9 à 12,4 millions — c'est-à-dire de 37,3 à 46%. Il y a un progrès évident, encore que très mesuré.

Graph 1.

Development of the Approximate Quantities of Traffic for 1930 to 1932 on the European and Mediterranean System.

Quantities produced.

In 1932, Germany, France, the United Kingdom and Italy produced 18,900,000 ton-kilometres, 9,200,000 of which were utilised. The rest of Europe produced 8,020,000 ton-kilometres, of which 3,390,000 were utilised.

The German system, if we add to it the German-Soviet "Deruluft" undertaking, produced and utilised as many ton-kilometres as the undertakings of Belgium, the Netherlands, Czechoslovakia, Switzerland, Poland, Spain, Sweden, Denmark, Finland, Austria, Hungary, Greece, Yugoslavia and Roumania taken all together.

Development of Quantities.

For 1930 to 1932, the kilometric tonnage produced rose from 24.6 to 27 million ton-kilometres; utilisation from 9 to 12.4 millions—that is to say, from 37.3 to 46 per cent. There is thus an evident, though very gradual, progress.

(1) Le Gouvernement italien a, depuis l'édition du rapport provisoire, précisé ces chiffres comme suit :

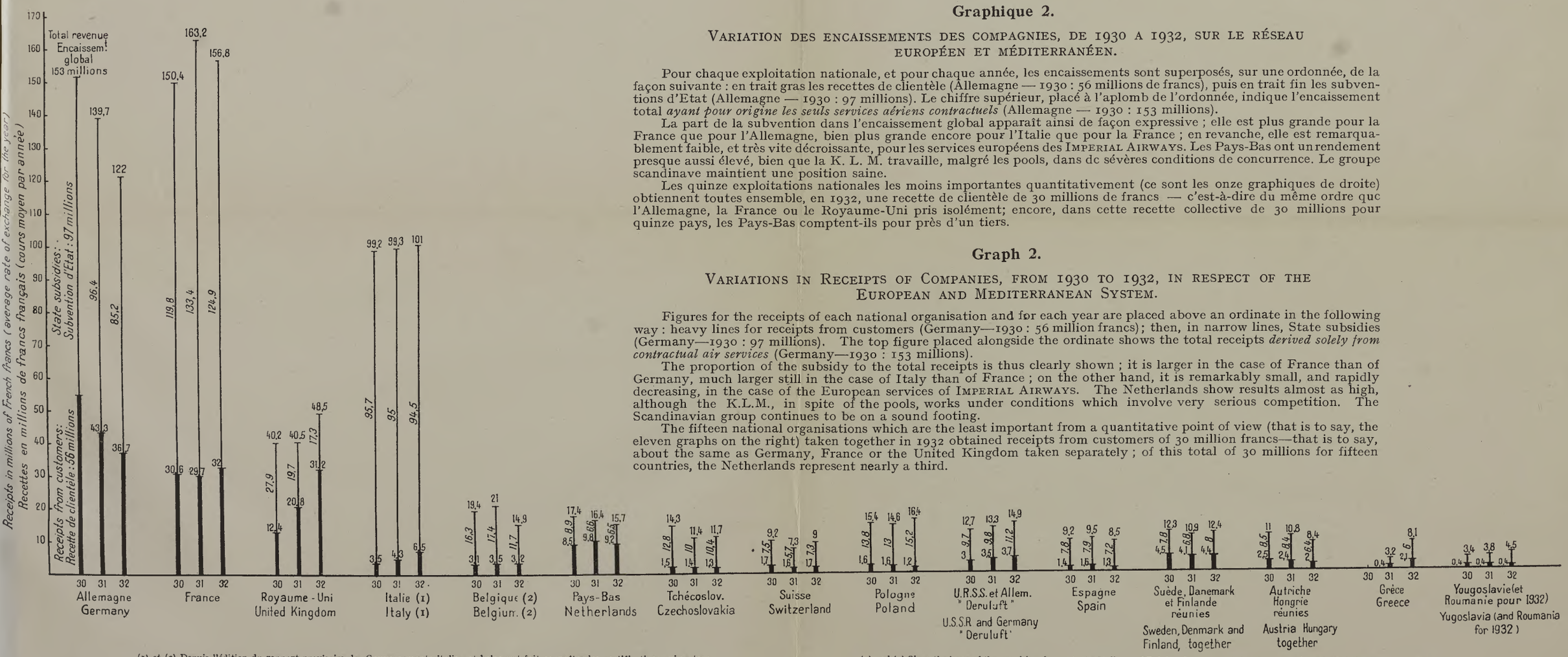
(1) Since the provisional report was issued, the Italian Government has submitted the following amended figures :

	Quantités produites Quantity produced	Quantités utilisées Quantity utilised
1930	3,79	1,32
1931	3,75	1,30
1932	4,04	1,78

(2) Le Gouvernement néerlandais a, depuis l'édition du rapport provisoire, communiqué les chiffres pour 1930 et 1931 et précisé, pour 1932, la « quantité utilisée » :

(2) Since the provisional report was issued, the Netherlands Government has communicated the figures for 1930 and 1931 and amended the "quantity utilised" for 1932 :

	Quantité produite Quantity produced	Quantité utilisée Quantity utilised
1930	1,42	0,68
1931	1,69	0,81
1932	1,63	0,76



Graphique 2.

Variation des encaissements des compagnies, de 1930 a 1932, sur le réseau européen et méditerranéen.

Pour chaque exploitation nationale, et pour chaque année, les encaissements sont superposés, sur une ordonnée, de la façon suivante : en trait gras les recettes de clientèle (Allemagne — 1930 : 56 millions de francs), puis en trait fin les subventions d'Etat (Allemagne — 1930 : 97 millions). Le chiffre supérieur, placé à l'aplomb de l'ordonnée, indique l'encaissement total *ayant pour origine les seuls services aériens contractuels* (Allemagne — 1930 : 153 millions).

La part de la subvention dans l'encaissement global apparaît ainsi de façon expressive ; elle est plus grande pour la France que pour l'Allemagne, bien plus grande encore pour l'Italie que pour la France ; en revanche, elle est remarquablement faible, et très vite décroissante, pour les services européens des Imperial Airways. Les Pays-Bas ont un rendement presque aussi élevé, bien que la K. L. M. travaille, malgré les pools, dans dc sévères conditions de concurrence. Le groupe scandinave maintient une position saine.

Les quinze exploitations nationales les moins importantes quantitativement (ce sont les onze graphiques de droite) obtiennent toutes ensemble, en 1932, une recette de clientèle de 30 millions de francs — c'est-à-dire du même ordre que l'Allemagne, la France ou le Royaume-Uni pris isolément; encore, dans cette recette collective de 30 millions pour quinze pays, les Pays-Bas comptent-ils pour près d'un tiers.

Graph 2.

Variations in Receipts of Companies, from 1930 to 1932, in respect of the European and Mediterranean System.

Figures for the receipts of each national organisation and for each year are placed above an ordinate in the following way : heavy lines for receipts from customers (Germany—1930 : 56 million francs); then, in narrow lines, State subsidies (Germany—1930 : 97 millions). The top figure placed alongside the ordinate shows the total receipts *derived solely from contractual air services* (Germany—1930 : 153 millions).

The proportion of the subsidy to the total receipts is thus clearly shown ; it is larger in the case of France than of Germany, much larger still in the case of Italy than of France ; on the other hand, it is remarkably small, and rapidly decreasing, in the case of the European services of Imperial Airways. The Netherlands show results almost as high, although the K.L.M., in spite of the pools, works under conditions which involve very serious competition. The Scandinavian group continues to be on a sound footing.

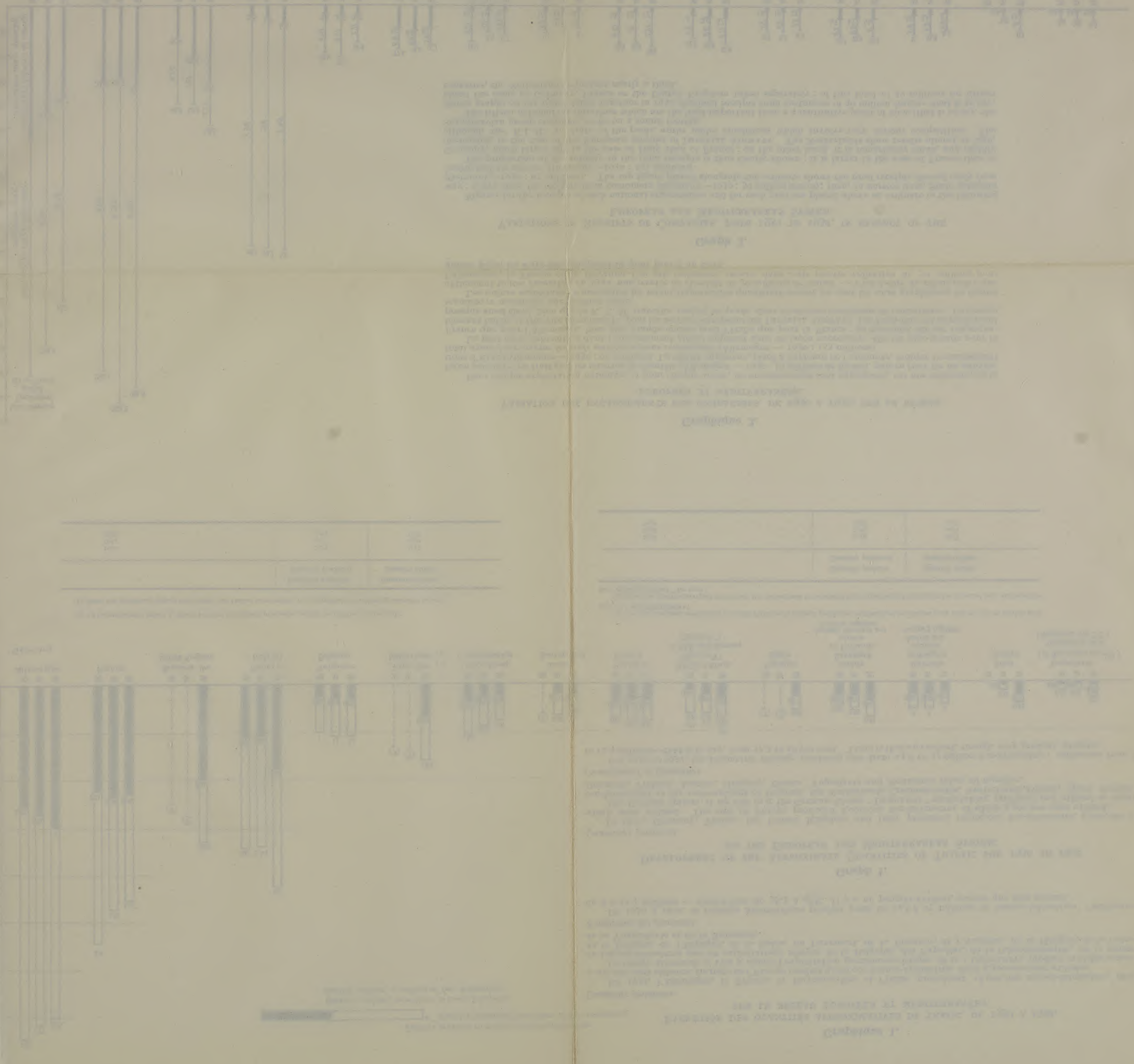
The fifteen national organisations which are the least important from a quantitative point of view (that is to say, the eleven graphs on the right) taken together in 1932 obtained receipts from customers of 30 million francs—that is to say, about the same as Germany, France or the United Kingdom taken separately ; of this total of 30 millions for fifteen countries, the Netherlands represent nearly a third.

(1) et (2) Depuis l'édition du rapport provisoire, les Gouvernements italien et belge ont fait connaître les rectifications suivantes :

Italie. — Recettes de clientèle (en francs français) : 1930 : 6,6 — 1931 : 6,6 — 1932 : 8,7.
Belgique. — Recettes de clientèle (en francs français) : 1932 : 4,9.

(1) and (2) Since the issue of the provisional report, the Italian and Belgian Governments have communicated the following corrections :

Italy.—Receipts from customers (in French francs) : 1930 : 6.6 — 1931 : 6.6 — 1932 : 8.7.
Belgium.—Receipts from customers (in French francs) : 1932 : 4.9.



P_3 have been calculated for each country and each year on the basis of the receipts from customers and subsidies. They have been shown on the right of each of the tables II, III and IV.

INDEX P_1.

The first index, P_1, represents the ratio between receipts from customers (solely as regards the regular contractual transport services) and the State subsidy. The companies receive other receipts and, in many cases, other subsidies. Both have been eliminated. By definition :

$$P_1 = \frac{\text{Receipts from customers}}{\text{Subsidies}}$$

for the figures given under these heads in *Tables II, III* and *IV*.

If, therefore, $P_1 < 1$, the subsidies of the air service in question still exceed its receipts; and if $P_1 > 1$, the service has completed the first stage, at which subsidies and receipts from customers are equal.

In 1930, no country in Europe had advanced so far. The Netherlands had almost reached this milestone with $P_1 = 0.96$, and no doubt had *previously* passed beyond it.

In 1931, the United Kingdom ($P_1 = 1.05$), Finland ($P_1 = 1.25$), and the Netherlands ($P_1 = 1.48$) completed this stage.

In 1932, only these three countries had attained this advanced stage. P_1 was equal to 1.8 in the United Kingdom and to 1.59 in Finland, while the Netherlands index had fallen slightly to 1.43. After them came Sweden (0.46) and Germany (0.43). The French ratio was 0.26, the Italian barely 0.07, and the Polish ratio 0.08.

The average for Europe was $P_1 = 0.35$.

* * *

INDEX P_2.

$$P_2 = \frac{\text{Receipts from customers}}{\text{Total revenue}}$$

This ratio, which is ascertained less frequently than the former, possibly because it is necessarily less favourable in appearance, shows the extent of financial autonomy achieved by the system in question *vis-à-vis* the State ; if $P_2 = 1$, this means that the subsidy has ceased and that the revenue is obtained solely from receipts from customers.

Naturally, no national air lines in Europe have yet reached that stage. However, in 1931 and 1932, the three countries for which $P_1 > 1$ necessarily show for P_2 a ratio in excess of 0.5 :

	P_2 (1931)	P_2 (1932)
Finland	0.556	0.614
United Kingdom	0.512	0.642
Netherlands	0.596	0.589

In 1932 :

The Swedish ratio was .. $P_2 = 0.316$
The German ratio was .. $P_2 = 0.301$
The French ratio was .. $P_2 = 0.203$
The Polish ratio was .. $P_2 = 0.073$
The Italian ratio was .. $P_2 = 0.064$

The average for Europe is $P_2 = 0.247$.

* * *

INDEX P_3.

$$P_3 = \frac{\text{Subsidy}}{\text{Total revenue}}$$

P_3 is therefore equivalent to $\frac{P_1}{P_2}$ and $P_2 + P_3 = 1$.

In other words, P_3 represents, in the form of a percentage, the difference between P_2 and the unit. Consequently, assuming that the accounts of the enterprise are reduced to the factors taken into consideration in this report, P_3 represents as a percentage the *distance* which the enterprise has still to cover in order to achieve financial autonomy.

From this standpoint, the most striking progress is that made by *Imperial Airways*.

	Distance remaining to be covered			Gain (+) or loss (—).
	% P_3 (1930)	% P_3 (1931)	% P_3 (1932)	
United Kingdom	69	49	36.7	+ 33.3
Finland	53	44	38.5	+ 14.5
Netherlands	51	40	41	+ 10
Sweden	63	66	68.3	— 5.3
Germany (without " Deruluft ")	63	69	70	— 7
France	80	82	80	0
Poland	89	90	94	— 5
Italy	96	95.5	93	+ 3
Europe (average)	68.6	70	67.3	+ 1.3

Hence, according to this index, and *assuming that financial autonomy is the goal in view*, I may say that, at the end of 1932, United Kingdom enterprises had gone nearly two-thirds of the way, the German enterprises two-fifths, the French enterprises one-fifth, the Italian enterprises one-fifteenth, and air transport in Europe as a whole nearly one-third.

These results have been obtained in from ten to twelve years.

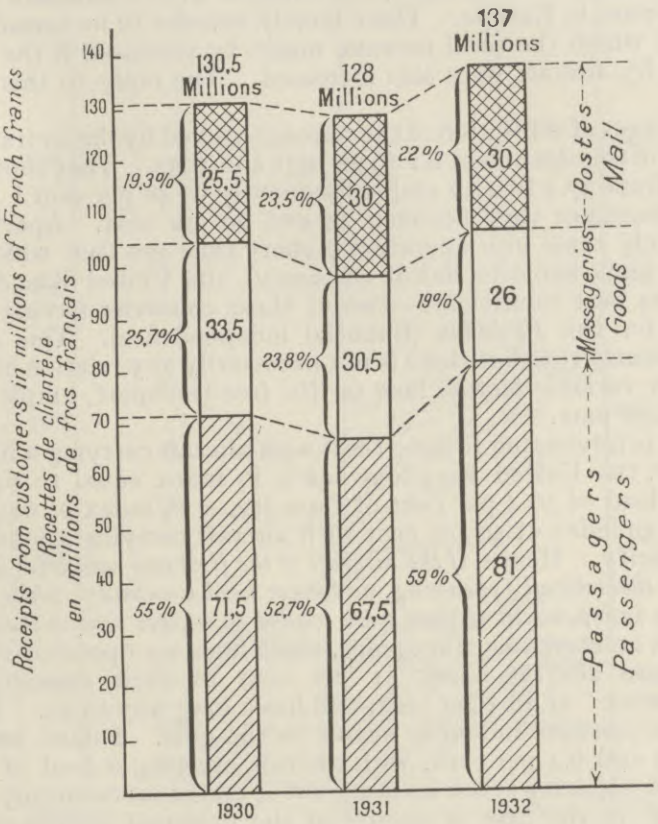
RESPECTIVE VALUES OF THE VARIOUS TYPES OF FREIGHT.

Attention was next paid—again on the basis of *Tables II, III* and *IV*—to the apportionment by categories of freight of the receipts from customers obtained on the European system. This is shown in *Graph* 3, which indicates, in absolute figures and percentages, the contribution of each type of freight to the aggregate financial result.

There is a fairly definite tendency towards a slight increase in the quantity of mail carried, accompanied by a more marked decline in receipts from goods ; there is a definite increase in receipts from passengers which, in 1932, amounted to *three-fifths of the total receipts* (this proportion must have been even higher in 1933). The general statistics for the period 1926-1929 showed that the transport of passengers represented, *in weight*, approximately 70 per cent of the traffic ; in 1932, this freight represented in *kilometric tons* 71 per cent of the quantity of freight utilised. It forms the principal freight carried by air in Europe.

Graph 3.

CLASSIFICATION OF RECEIPTS FROM CUSTOMERS IN 1930, 1931 AND 1932.
The percentages for each year are shown laterally.



For 1932, the proportions between the quantity utilised and the receipts were as follows :

	Ton-kilometres carried	%	Approximate receipts (in francs)	%	Receipts per ton-kilometre
Passengers	8,803,228	71	81,000,000	59	8 francs 75
Goods	2,747,052	22	26,000,000	19	8 francs 95
Mail	851,052	7	30,000,000	22	34 francs
	12,401,332	100	137,000,000	100	

This table shows (last column) the average receipts per *ton-kilometre carried*. These tally remarkably closely with the figures given by the specialists. Certainly passenger receipts are usually reckoned at from 11 to 12 francs per ton-kilometre and goods receipts at 10 francs, but my result simply shows the effect of free transport or reduced rates granted to passengers and of the free transport of hand-luggage at the rate of from 12 to 20 kg. per passenger.

These specific receipts and proportions determine for a given stage of technique and the system under consideration, the receipts from customers obtainable by air transport enterprises in Europe. There merely remains to be considered the question of the extent to which the total revenue might be increased if the utilisation of the tonnage offered by aircraft were also increased. The reply to this question is given in *Graph* 4.

The percentages of utilisation of the tonnage offered by the air transport enterprises have been given in this document for 1930, 1931 and 1932. They show that the average coefficient rose from 37.3 to 41.7 and subsequently to 46 per cent.[1]

All the percentages vary between 25 and 70 per cent. Apart from the Greek system, which only came into operation a short time ago (but which, using German material, shows remarkable technical efficiency), the United Kingdom, Sweden and Finland have the best coefficients—two of these countries having been included in the first group for the P_2 *index* (financial independence). This shows that those services are efficiently run, but there is not necessarily any relation of cause and effect, since many other variable factors (low tariffs, free transport, ample landing-grounds, etc.) may play their part.

However, it is interesting to note that, with aircraft carrying a load of 62 per cent of their capacity, the United Kingdom has a P_2 index equal to 64.2 per cent, and Finland, with a load of 56.4 per cent of capacity, a P_2 index of 61.4 per cent. The Netherlands has an index of 59 per cent with aircraft carrying a load of only 42.5 per cent of their capacity. Hence, *if the aircraft of the first two countries carried a complete load,*[2] *they would, theoretically speaking, no longer need a subsidy, while the aircraft of the K.L.M. would be independent if they were loaded to 75 per cent of their capacity*. This proves that, from an economic standpoint, these lines are operated very efficiently.

France, whose aircraft carry 51 per cent of their capacity and have an " independence index " of 20.3 per cent, still has a long way to go. Germany (42 per cent load and 30 per cent index) is nearer to the goal. Poland and Italy have an index of only 7.3 and 6.4 per cent, with aircraft carrying a load of 40 per cent and 41 per cent of their capacity ; their lines are not operated economically.

Consequently, in the case of several of the principal European enterprises, an increase in the utilisation of tonnage might have a decisive effect, *provided tariffs remained unchanged*. I am already justified in thinking that the problem of unsubsidised air transport in Europe, or at least in certain parts of Europe, is not a contradiction in terms. It is a matter of efficient technique—but, on the lines already laid down, of sound organisation—but examples already exist. I have not mentioned political conditions or the effect of artificial competition based on subsidies.

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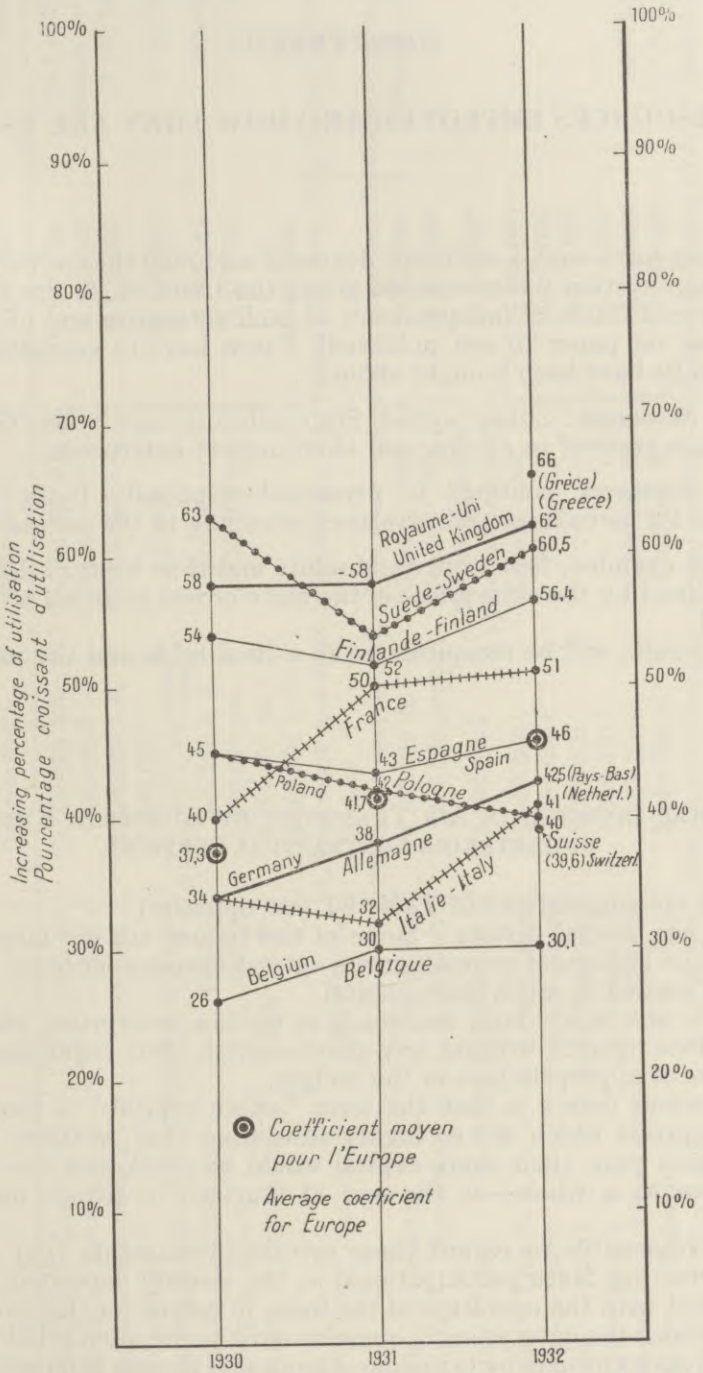
[1] These coefficients of utilisation may sometimes be very deceptive. Owing to the difficulty of certain routes and the distance between landing grounds, a high coefficient of utilisation (60 to 70 per cent) may correspond—particularly in the case of certain European seaplane lines—to the transport of a very small quantity of freight (25 to 100 kg.).

[2] This is a purely theoretical assumption, but it is nearer to the truth in the case of aviation than as regards any other means of public transport, in view of the elasticity of air transport and the small weight-carrying capacity of he average aircraft.

Graph 4.

COEFFICIENTS OF UTILISATION OF TONNAGE, FROM 1930 TO 1932.



N.B.—The Italian Government has corrected the utilisation coefficient for 1931 to 34.2%.

CHAPTER II.

RESOURCES EMPLOYED AND HOW THEY ARE USED.

After setting forth with a sufficient degree of accuracy the traffic results obtained by the European system under consideration, the trend of its financial results and, lastly, the degree of financial independence of each enterprise and of the system as a whole, as shown on paper (if not achieved), I now have to consider the means by which these results have been brought about.

Financial Resources : Share capital, State subsidies and other Government and official assistance granted to contractual air transport enterprises.

Technical Resources, confined to personnel—especially flying personnel—and material ; parks for aeroplanes and seaplanes belonging to the companies.

I shall next examine, first from an absolute and then from a relative standpoint, the results obtained by the enterprises in the more or less artificial situation in which they are placed.

The chief results will be recapitulated in a final table and the main conclusions drawn.

* * *

1. Capital invested in Air Transport by European Enterprises undertaking Contractual Services.

These data are summarised in *Table VI* (see opposite).

This table has several defects. Some of the figures are too large, inasmuch as several of the most important companies run extra-European services ; otherwise they would not have needed so much share capital.

The table is also inaccurate, inasmuch as certain enterprises which are purely State organisations operate without any share capital, their requirements being met simply by means of appropriations in the budget.

Its most serious defect is that the term " share capital " is incongruous when applied to enterprises which are so highly subsidised that, without the renewal of public credits each year, their share capital would be swallowed up—as regards the European system as a whole—at the end of fourteen or fifteen months' running operations.

It is more reasonable to regard these private investments (433 million French francs, after deducting State participations) as the *security* deposited by the private interests entrusted with the operation of the lines, in return for this concession. The true capital on which the enterprises in question exist is the substantial mass of private wealth—taken from its owners by taxation—the annual income from which corresponds to the total annual subsidy.

Table VI.

Capital invested in Companies for Contractual Air Transport.

I. Total share capital.
II. Capital invested by the State (or by administrative bodies) (if any).

	En monnaie nationale / In national currency		En fr. français (valeur de change octobre 1932) / In French francs (exchange value, October 1932)	
	Capital global / Total capital	Part de l'Etat / State share	Capital global / Total capital	Part de l'Etat / State share
Allemagne — Germany. . . . . D. L. H.	25.000.000 RM	6.500.000 RM	152.500.000	39.650.000
Autriche — Austria . . . . . « Oelag »	400.000 S	Néant — Nil	1.440.000	Néant — Nil
Belgique — Belgium (1) . . . « Sabena »	20.000.000 f. b.	10.000.000 f. b.	14.140.000	7.070.000
Royaume-Uni / United Kingdom . « Imperial Airways »	£1.000.000 dont / of which £624.080 émises / issued	£25.000	86.672.800	2.166.800
Danemark — Denmark . . . . . D. D. L.	445.000 c. d.	220.000 c. d.	1.999.385	998.460
Espagne — Spain . . . . . L. A. P. E.	2.650.000 pes.	2.650.000 pes.	5.527.900	5.527.900
Finlande — Finland . . « Aéro O. Y »	2.000.000 m. f.			
	120.000.000 f. f.		120.000.000	
France. . . . . « Air France »	L'Etat reçoit en actions de jouissance, sans valeur nominale, 25% du capital-actions de la Société. The State receives 25% of the share capital of the company in shares of no par value.			
Grèce — Greece. . . . . E. E. E. S.	28.500.000 dr.	Néant (2) Nil	9.462.000	Néant — Nil
Hongrie — Hungary. . . . . « Malert »	250.000 pengö	Néant — Nil	1.112.500	» »
Italie — Italy . « Sta Aerea Mediterranea »	18.000.000 l.	Part non précisée / Share not indicated	23.454.000	» »
Italie — Italy . . . . . S. A. N. A.	12.000.000 l.	Néant — Nil	15.636.000	» »
Italie — Italy . . . . . « Avio Linee »	4.000.000 l.	» »	5.212.000	» »
Italie — Italy . . . . « Aero Espresso »	5.000.000 l.	» »	6.515.000	» »
Italie — Italy . . . . . S. I. S. A.	5.000.000 l.	» »	6.515.000	» »
Pays-Bas — Netherlands . . . K. L. M.	4.353.200 fl.	3.000.000 fl.	44.602.885	30.738.000
Pologne — Poland . . . . P. L. L. « Lot »	8.000.000 zl.	6.880.000 zl.	22.848.000	19.677.000
Roumanie — Roumania. . . L. A. R. E. S.	Entreprise d'Etat sans capital déclaré. — State undertaking with no declared capital.			
Suède — Sweden. . . . . A. B. A.	584.000 c. s.	Néant — Nil	2.615.150	Néant — Nil
Suisse — Switzerland . . . « Swissair »	800.000 f. s.	» »	3.933.600	» »
Tchécoslovaquie — Czechoslovakia C. S. A.	Entreprise d'Etat sans capital déclaré. — State undertaking with no declared capital.			
Tchécoslovaquie — Czechoslovakia C. L. S.	8.000.000 c. t.	Néant — Nil	6.032.000	Néant — Nil
U. R. S. S. et Allemagne / U.S.S.R. and Germany . « Deruluft »	1.300.000 RM	» »	7.930.000	» »
Yougoslavie — Yugoslavia . « Aeroput »	9.000.000 din.	Néant (?) Nil	4.050.000	» »

(1) Plus a guarantee by the State and Colony for 39,080,000 f. b. of debentures.
(2) The State guarantees interest of 8 per cent in the share capital of the company.

2. Direct Annual Subsidies.

These data are summarised in *Table VII* (see opposite).

This table is practically complete and, in most cases, accurate, at least as regards the values in national currency; as regards the exchange values adopted for the conversion of these amounts into French francs, it was not possible to take account of variations in the cost of living and the local purchasing power of the currency.

In any case, the total for each year is fairly reliable. I do not think, however, that the falling-off in 1932 as compared with 1931 (417 millions against 442—*i.e.*, roughly 6 per cent) is of any real significance, as the marked decline in sterling and the European currencies attached to sterling had a considerable effect on certain exchange values, but affected to a much smaller extent the purchasing power in the home markets, where the majority of the expenditure is incurred.

Moreover, it is quite possible that the subsidies inserted in *Table VII* may not cover all the public credits granted for the assistance of companies. In Germany, the subsidies of the States and towns, which were much smaller from 1930 to 1932 than from 1925 to 1929, must still be in the neighbourhood of 2 million RM. a year. In several countries, special credits have been voted for the acquisition of material. Elsewhere, loan funds with a very low rate of interest have been constituted ; in other countries again, the State has had certain model aircraft built—sometimes three or four—which have subsequently been transferred to the enterprises by a hire-purchase system, under which the State has recovered only one-third or one-fourth of its outlay.

In particular, the methods by which mileage subsidies are granted, the cost of mail transport is refunded, lump-sum payments in respect of mail transport are calculated and surtaxes are payable to the carrier or not, vary so greatly that it is impossible for a single table to cover this question.

In conclusion, I consider that contractual air transport enterprises in the territorial area in question received, from 1930 to 1932 inclusive, some 1,500 million French francs in the form of direct subsidies—*i.e.*, on an average, 500 million francs a year.

3. Other State Expenditure on behalf of Contractual Air Transport Enterprises.

Notwithstanding the definite information asked for on this point in the basic questionnaire, the replies received were inadequate. This was inevitable, in view of the diversity of budgetary methods and, in particular, the fact that, as regards expenditure on so-called " ground organisation ", no distinction is made in several countries between the requirements of civil aviation and those of military aviation. Moreover, in the case of certain countries where these credits are usually combined, the total figure entered in the budget was not communicated to me.

Table VIII has therefore been drawn up under these conditions.

It will be noted that, in the case of each country, I have stated as far as possible how the credits are allocated. These brief particulars are sufficient to show that the table has by no means exhausted the question of *expenditure (other than direct subsidies) on behalf of air transport.* The greater part of the running expenses of the ground organisation (personnel, watchmen, electric power, etc.), which are nearly always borne by the State, and also the cost of the central offices responsible for management and supervision set up in Europe as a result of the development of air transport, should be added to the figure given.

SUB

DIR

Pays Country	
ALLEMAGNE — GERMANY. . . .	Deut (re (o
AUTRICHE — AUSTRIA.	Oest (r (o
BELGIQUE — BELGIUM.	S. A (r (o
ROYAUME - UNI — UNITED KINGDOM	Imp (r (o
DANEMARK — DENMARK. . . .	Dan (r (o
ESPAGNE — SPAIN	L. A (r (o

Tableau VII. — Table VII.

SUBVENTIONS DIRECTES AU TRANSPORT AÉRIEN PUBLIC DANS LE CADRE TERRITORIAL EUROPÉEN CONSIDÉRÉ

DIRECT SUBSIDIES TO PUBLIC AIR TRAFFIC IN THE EUROPEAN TERRITORIAL AREA UNDER CONSIDERATION.

Pays Country	Compagnies Companies	1930		1931		1932	
		En monnaie nationale In national currency	En francs français In French francs	En monnaie nationale In national currency	En francs français In French francs	En monnaie nationale In national currency	En francs français In French francs
ALLEMAGNE — GERMANY. . . .	Deutsche Lufthansa A. G. (réponse officielle) (official reply)	16.000.000 RM.	96.960.000	15.800.000 RM.	96.380.000	14.100.000 RM.	86.010.000
AUTRICHE — AUSTRIA.	Oest. Luftv. A. G. (réponse officielle) (official reply)	2.117.250 S.	7.622.100	2.087.000 S.	7.513.200	1.530.000 S.	5.508.000
BELGIQUE — BELGIUM.	S. A. B. E. N. A. (réponse officielle) (official reply)	22.873.998 f. b.	16.263.410	24.437.794 f. b.	17.350.835	16.218.522 f. b.	11.516.200
ROYAUME - UNI — UNITED KINGDOM	Imperial Airways (réponse officielle) (official reply)	£225.000	27.861.750	£200.000	19.770.800	£200.000	17.334.400
DANEMARK — DENMARK. . . .	Danske Luftfartselska (réponse officielle) (official reply)	350.000 c. d.	2.381.750	350.000 c. d.	1.955.450	350.000 c. d.	1.572.550
ESPAGNE — SPAIN	L. A. P. E. (réponse officielle) (official reply)	3.000.000 pes.	7.935.000	3.450.000 pes.	7.841.850	3.450.000 pes.	7.196.700
FINLANDE — FINLAND.	« Aero O. Y. » (réponse officielle) (official reply)	2.059.735 m. f.	1.322.350	2.037.400 m. f.	1.043.150	1.943.930 m. f.	723.140
FRANCE	Air Union Air Orient Lignes Farman Aéropostale C. I. D. N. A. (réponse officielle) (official reply)	119.800.000 f. f. (4/5 d'un exercice de 15 mois) (4/5 of a financial year of 15 months)	119.800.000	33.444.115 f. f.	133.444.115	124.829.625 f. f.	124.829.625
GRÈCE — GREECE.	S. H. C. A. (E. E. E. S.) - S. A. (réponse officielle) (official reply)	Pas de trafic No traffic	Pas de trafic No traffic	8.172.943 dr.	2.713.420	18.000.000 dr. (env. — approx.)	5.976.000
HONGRIE — HUNGARY.	« Malert »	200.000 pengö	890.000	200.000 pengö	890.000	200.000 pengö	890.000
ITALIE — ITALY [1]	S. A. N. A. - S. A. M. S. I. S. A. - Aero Expresso Aviolinee Italiane (réponse officielle) (official reply)	71.776.633 lires	95.750.030	72.730.619 lires	95.058.920	72.565.335 lires	94.552.630
NORVÈGE — NORWAY	(Aide à D. L. H.) (Subsidy to D.L.H.)	10.000 c. n.	68.050	10.000 c. n.	56.080	10.000 c. n.	43.710
PAYS-BAS — NETHERLANDS . .	K. L. M. (réponse officielle) (official reply)	861.812 fl.	8.859.425	646.177 fl.	6.636.885	628.044 fl.	6.431.170
POLOGNE — POLAND	P. L. L. Lot (réponse officielle) (official reply)	4.565.783 zl.	13.035.310	4.860.000 zl.	13.812.120	5.312.000 zl.	15.171.070
ROUMANIE — ROUMANIA. . . .	L. A. R. E. S. (réponse complémentaire du service officiel) (additional reply from the official service)	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	Pas de trafic No traffic	8.590.000 lei	1.297.090
SUÈDE — SWEDEN	A. B. A. (réponse officielle) (official reply)	596.760	4.084.820	632.530	3.729.395	1.257.000 c. s. (dont 500.000 c. s. de forfait postal, (including 500,000 c. s. lump payment for mails	5.628.846
SUISSE — SWITZERLAND	Swissair (réponse officielle) (official reply)	1.162.068 f. s.	5.748.750	1.516.522 f. s.	7.541.663	1.474.504 f. s.	7.250.135
TCHÉCOSLOVAQUIE — CZECHOSLOVAKIA	C. L. S. C. S. A. (réponse officielle) (official reply)	6.784.385 c. t. 6.540.135 c. t.	5.128.995 4.944.340	10.121.508 c. t. 6.896.466 c. t.	7.611.375 5.186.140	8.316.000 c. t. 5.485.510 c. t.	6.270.265 4.136.075
YOUGOSLAVIE — YUGOSLAVIA. .	Aeroput (réponse officielle) (official reply)	6.646.644 din.	2.957.755	7.531.632 din.	3.389.235	6.276.570 din.	2.824.455
U. R. S. S. (et ALLEMAGNE) — U.S.S.R. (and GERMANY) . .	Deruluft (réponse privée) (private reply)	1.614.026 RM.	9.780.995	1.597.929 RM.	9.747.365	1.851.395 RM.	11.293.510
		Total . . .	430.394.830	Total . . .	441.671.998	Total . . .	416.455.571

[1] Les sommes portées ici diffèrent de celles qui figurent dans la réponse officielle et qui étaient relatives à des années budgétaires commençant en juillet. On a arbitrairement divisé par deux ces crédits et additionné, par exemple, la moitié du crédit 1931-32 et celle du crédit 1932-33 pour obtenir la somme portée ici sous 1932.

[1] The sums given here are different from those in the official reply, which related to budgetary years beginning in July. These credits were arbitrarily divided into two parts and, for instance, half the 1931-32 credit and half that for 1932-33 were added together to obtain the sum shown here under 1932.

Table VIII.

EXPENDITURE OTHER THAN DIRECT SUBSIDIES OF EUROPEAN AIR TRANSPORT IN THE TERRITORIAL AREA UNDER CONSIDERATION.

(Exchange value for October 1931 taken as an average.)

Country	Expenditure 1932 (+) or average value 1930-1932 (‡)	
	In national currency	In French francs
AUSTRIA (ground installation, etc.)	832,325 S ‡	2,996,370
BELGIUM (ground installation and management)	11,799,000 B.f. ‡	8,377,290
UNITED KINGDOM (75 % of the " Expenditure on ground organisation ")	£57,803 ‡	5,710,935
CZECHOSLOVAKIA	3,000,000 C.c. (?)	2,256,000
DENMARK		
FRANCE (aerodromes, wireless service and signalling, national equipment, contributions from chambers of commerce)	17,380,000 F. f. ‡	17,380,000
GERMANY (ground organisation and liaisons)	2,500,000 RM ‡	15,250,000
GREECE (ground installation)	6,833,000 dr. ‡	2,268,555
HUNGARY	555,490 pengö (1932-33)	2,477,485
ITALY	12,500,000 l. (?)	16,337,500
NETHERLANDS (ground installation)	179,211 fl. ‡	1,825,800
POLAND (ground installation and working)	336,000 zl. ‡	954,910
ROUMANIA	5,000,000 lei (?)	755,000
SPAIN (ground installation)	1,200,000 pes. ‡	2,727,600
SWEDEN (aerodromes and liaisons)	202,000 S.c. + 105,000 S.f.	1,190,990 522,165
SWITZERLAND (ground installation and working)	Federal budget; 660,000 S.f. cantons and meteorological.	3,282,180
YUGOSLAVIA	2,000,000 din. (?)	900,000
		85,212,820

Taking into account these disbursements, we consider that, roughly, 150 million francs should be added as supplementary State expenditure to the 500 millions of direct annual subsidies, instead of the 85 millions odd shown in *Table VIII*.

4. FLYING MATERIAL, FLYING PERSONNEL, OTHER PERSONNEL.

The annual statistics of the United Kingdom *Air Ministry*, interpreted and corrected so as to confine them to the system under consideration, show that the following material was used by the regular air transport enterprises in Europe during 1931 and 1932 *(Table IX)*.

Table IX.

FLYING MATERIAL USED BY THE COMPANIES.

		1931 (31/XII)	1932 (31/XII)
FLYING MATERIAL		Aeroplanes and hydroplanes in service	
	1931—Total 764, 635 in Europe	635	
	1932—Total 754, 630 in Europe		630
		Total paying load	
	1931—Total 620 tons, 525 in Europe	525 t.	
	1932—Total 610 tons, 508 in Europe		508 t.
		Total engine power	
	1931—Total 473,000 HP; including about 400,000 in Europe	400,000 HP	
	1932—Total 490,000 HP; including about 415,000 in Europe		415,000 HP

The situation as regards material cannot have changed much in 1933, my last figures giving the number of machines in service on December 31st, 1932. However, since 1931, the figures have been too high, as spare machines (or machines awaiting a purchaser) whose annual service is insignificant continue to be included in the companies' parks. Account should be taken of this observation when the time comes to examine the rotation of material.

The flying personnel employed has been calculated as accurately as possible in *Table X.*

Table X.

FLYING PERSONNEL EMPLOYED BY THE COMPANIES.

	1931 (31/XII)	1932 (31/XII)
Pilots.		
In 1931, total 538, about 450 in Europe	450	
In 1932, total 535, about 450 in Europe		450
Flying personnel as a whole (pilots, mechanics, wireless operators).		
In 1931, total 1,150, about 980 in Europe	980	
In 1932, total 1,091, about 940 in Europe		940

It would be interesting to add to these figures the personnel charged with the duties of management and administration at the headquarters, centres of management and branches, and the ground staff and workmen employed at the airports, workshops, landing-grounds and agencies. Unfortunately, this information is available for a very

small number of countries or enterprises. However, these figures are given below for purposes of information and are compared with the annual kilometric traffic. (See *Table XI.*)

Table XI.

MAXIMUM TOTAL PERSONNEL.

Germany (without " Deruluft ")	1930 : 1,865 persons for 9,062,672 km., *i.e.* 1 for 4,860 km. flown. 1931 : 1,815 persons for 8,677,721 km., *i.e.* 1 for 4,780 km. flown. 1932 : 1,545 persons for 7,728,000 km., *i.e.* 1 for 5,000 km. flown. In 1932, the flying personnel represented 14% of the total number.
" *Deruluft* "	1930 : 144 persons for 928,000 km., *i.e.* 1 for 6,440 km. flown. 1931 : 168 persons for 903,000 km., *i.e.* 1 for 5,300 km. flown. 1932 : 200 persons for 981,000 km., *i.e.* 1 for 4,950 km. flown. In 1932, the flying personnel represented 10.5% of the total number.
France	1929 : 2,905 persons for 9,435,434 km., *i.e.* 1 for 3,240 km. flown. 1932 : 2,500 persons for 9,155,867 km., *i.e.* 1 for 3,660 km. flown. In 1932, the flying personnel represented 7.5% of the total number.

This table calls for various observations. The figure : 1 *person employed per* 4,500 *km. flown per annum* appears to represent the European average. I understand that the personnel employed by certain enterprises, such as *Imperial Airways* and the *K.L.M.*, whose technical organisation is efficiently centralised, is proportionately much smaller. On the other hand, the rate given for France appears to be unfavourable, unless account is taken of the fact that it is affected by long-distance services which are necessarily autonomous, such as the South American lines.

I do not think that the figures given for *Lufthansa* and *Deruluft* correspond to the European average, which is adversely affected by the multiplicity and seasonal nature of the services. I am prepared to accept a ratio of 8 per cent between the flying personnel and the maximum total personnel for the European system as a whole, and the total personnel employed on the system during the summer services can thus be estimated at 12,000.

A significant comparison can be made between this figure, however uncertain it may be, and that of the personnel employed in the United States of America by the regular air transport enterprises : approximately 6,300 persons in 1932 (5,997 on July 1st, 1933) for an annual distance flown of 81,000,000 kilometres in the case of the contractual services alone. This makes one person per 13,500 kilometres—*i.e.*, much less than in Europe for a given annual distance flown.

I considered it of interest also to establish, both for personnel and for material, the conditions of utilisation on the European system. These data are summarised in *Tables XII and XIII.*

Apart from the Roumanian enterprise (which has recently been established and is not yet very active), I find that the extreme figures are 24,180 kilometres (or 151 hours at 160 kmh.) for Hungary and 98,100 kilometres (or 613 hours at 160 kmh.) for the *Deruluft.* The average rate (64,400 kilometres in 402 hours) is low, especially if it is

Table XII.

UTILISATION OF PERSONNEL ON THE EUROPEAN NETWORK (1932).

Pays dont relèvent les compagnies	Kilométrage annuel Annual distance flown (in km.)	Personnel navigant (pilotes compris) Flying personnel (including pilots)	Nombre de pilotes Number of pilots	Nombre annuel de km. par pilote Annual number of km. per pilot	Nombre annuel d'heures de vol par pilote (à 160 kmh.) Annual number of hours flown per pilot (at 160 kmh.)	Country to which the companies belong
ALLEMAGNE . . .	7.003.718	217	103	68.000	425	GERMANY.
AUTRICHE	490.984	18	10	49.098	307	AUSTRIA.
BELGIQUE	1.140.380	27	14	81.500	510	BELGIUM.
ROYAUME-UNI . .	1.558.480	35	18	*86.500*	*540*	UNITED KINGDOM.
DANEMARK . . .	244.470	7	3	*81.500*	*509*	DENMARK.
ESPAGNE	609.800	22	9	67.700	476	SPAIN.
FINLANDE	257.440	11	4	64.200	401	FINLAND.
FRANCE	6.793.423	188	96	70.700	442	FRANCE.
GRÈCE	389.525	16	8	48.700	304	GREECE.
HONGRIE	121.000	30	5[1]	24.180	150	HUNGARY.
ITALIE	4.560.118	188	95	48.948	306	ITALY.
PAYS-BAS	1.271.623	34	15	*84.800*	*530*	NETHERLANDS.
POLOGNE	1.187.684	29	20	59.300	370	POLAND.
ROUMANIE . . .	198.360	16	7	28.400	177	ROUMANIA.
SUÈDE	310.661	22	8	38.800	242	SWEDEN.
SUISSE	670.436	23	8	*83.700*	*523*	SWITZERLAND.
TCHÉCOSLOVAQUIE	940.451	24	14	67.100	419	CZECHOSLOVAKIA.
U. R. S. S. et ALLEMAGNE (« Deruluft »). .	981.000	21	10	*98.100*	*613*	U.S.S.R. and GERMANY (" Deruluft ").
YOUGOSLAVIE . .	*241.425*	*12*	*4*	63.500	396	YUGOSLAVIA.
Ensemble européen . . .	**29.071.978**	**940**	**451**	**64.400**	**402**	**Total for Europe.**
Etats-Unis d'Amérique . .	**81.000.000**		**530** (environ) (approximately)	**153.000**	**850** (environ) (approximately)	**United States of America.**

compared with the 153,000 kilometres and 850 hours (at 180 kmh.) flown by each pilot on the United States system. In several cases, the number of hours flown in Europe

[1] The Hungarian Government states that the figure 15 entered here, in place of 5, in the provisional edition includes assistant pilots and wireless operators holding a pilot's certificate ; the official number of " first-class pilots " is 5.

would be slightly increased if it were possible to take account of the *true average speed* of the machines : 160 kmh. is certainly too high a speed for seven or eight national enterprises, and the time spent in the air each year by the pilots would thus be increased.

Naturally, in determining the American rate, no account was taken of the co-pilots, who are nearly always on board ; as a matter of fact, in the case of the regular traffic, the first pilot is always present and the co-pilots correspond to the " navigators " (who are often pilots or accustomed to piloting), who are included in the crew of the European aeroplane.

The conditions under which the material is used are shown in *Table XIII.*

Table XIII.

UTILISATION OF MATERIAL ON THE EUROPEAN NETWORK (1932).

Pays dont relèvent les compagnies	Kilométrage annuel Annual distance flown (in km.)	Nombre d'avions Number of machines	Nombre annuel de km. par avion Annual number of km. per machine	Nombre annuel d'heures de service par avion (à 160 kmh.) Annual number of hours' service per machine (at 160 kmh.)	Country to which the companies belong
ALLEMAGNE	7.003.718	154	45.500	285	GERMANY.
AUTRICHE	490.984	10	49.100	306	AUSTRIA.
BELGIQUE	1.140.380	19	60.000	375	BELGIUM.
ROYAUME-UNI . . .	1.558.480	18	*86.500*	*540*	UNITED KINGDOM.
DANEMARK.	244.470	5	48.800	305	DENMARK.
ESPAGNE	609.800	9	67.700	423	SPAIN.
FINLANDE	257.440	4	64.200	401	FINLAND.
FRANCE	6.793.423	181	37.500	234	FRANCE.
GRÈCE	389.525	4	*97.500*	*609*	GREECE.
HONGRIE	121.000	6	20.200	126	HUNGARY.
ITALIE	4.560.118	82	56.700	354	ITALY.
PAYS-BAS	1.271.623	28	45.400	283	NETHERLANDS.
POLOGNE	1.187.684	28	42.400	265	POLAND.
ROUMANIE.	198.360	8	24.700	154	ROUMANIA.
SUÈDE.	310.661	7	44.400	277	SWEDEN.
SUISSE	670.436	12	55.800	348	SWITZERLAND.
TCHÉCOSLOVAQUIE .	940.451	27	34.800	217	CZECHOSLOVAKIA.
U. R. S. S. et ALLEMAGNE («Deruluft»)	981.000	12	*81.700*	*510*	U.S.S.R. and GERMANY ("Deruluft").
YOUGOSLAVIE . . .	*241.425*	9	26.800	167	YUGOSLAVIA.
Ensemble européen	**29.071.978**	**623**	**46.600**	**291**	**Total for Europe.**
Etats-Unis d'Amérique . . .	**81.000.000**	**580** (environ approximately)	**140.000**	**780 h. à at 180 kmh.** (ou 875 h. à 160 kmh.) (or 875 h. at 160 kmh.)	**United States of America.**

This table is less satisfactory than the previous one, as will be realised when it is seen that the rates of utilisation (again excluding Roumania) vary from 20,200 kilometres and 126 hours (Hungary) to 97,500 kilometres and 609 hours (Greece). These discrepancies may be due to the overcrowding of a park or—on the contrary—to the restriction of the number of machines to a minimum. However, rates such as that for the Netherlands (45,400 kilometres and 283 hours) conflict with other very reliable information. The number of machines *actually* employed by the Netherlands *K.L.M.* on European lines is much smaller than appears from the table ; since seven machines are sufficient for the Indies service, it may be assumed that some twelve machines will suffice for the European traffic ; the average is therefore in the neighbourhood of 610 hours and 100,000 kilometres—figures which tally more closely with the rates of utilisation of *Fokker* aeroplanes (which I shall have occasion to mention, with certain others, in Chapter III) and also with the methods of administration of the enterprise.

Similarly the pilots of the *K.L.M.* from their second year of service onwards are known to exceed 800 hours of flying per annum. This figure should be compared with the American rate mentioned above.

As regards material, the American rate of utilisation is also very much higher. With 580 aeroplanes and seaplanes, the regular services produced in 1932 81,000,000 kilometres, corresponding to 140,000 kilometres and 875 hours per machine per annum, taking 160 kmh. as the average speed. As a matter of fact, 180 kmh. should be reckoned for 1932, thus reducing the annual average number of hours flown per machine to 780. This figure should be compared with the corresponding European rate : 291 hours, as given in *Table XIII*, and possibly 330 hours if account is taken of the *statistical* overcrowding of parks by machines withdrawn from the normal service.

* * *

In short, the material used and the results obtained can be approximately summarised in the following table *(Table XIV)*.

Table XIV.

SUMMARY OF THE STATISTICAL RESULTS OF CONTRACTUAL AIR TRANSPORT IN EUROPE AND ITS PROGRESS FROM 1930 TO 1932.

	1930	1931	1932
A. — *Resources employed :*			
Flying personnel		980	940
Pilots		450	450
Number of aeroplanes and seaplanes		635	630
Total horse-power		400,000 HP	415,000 HP
Total paying load		525 tons	508 tons

Table XIV *(continued).*

	1930	1931	1932
B. — *Quantities of traffic :*			
Annual distance flown (in km.)	32,000,000 km.	31,000,000 km. appr.	29,071,978 km.
Ton-kilometres produced	24,600,000 t.-km.	24,800,000 t.-km.	27,000,000 t.-km.
Ton-kilometres utilised ..	9,189,000 t.-km.	10,312,000 t.-km.	12,400,000 t.-km.
Coefficient of utilisation	37.3%	41.7%	46%
Average freight per machine	287 kg.	333 kg.	432 kg.
C. — *Utilisation of resources :*			
Distance flown per machine (in km.) ..		48,800 km.	46,600 km.
Number of hours per machine		325 h. (at 150 kmh.)	291 h. (at 160 kmh.)
Number of hours per day per machine		0.89 (54 minutes)	0.80 (48 minutes)
Number of hours flown per pilot		460 h. (at 150 kmh.)	402 h. (at 160 kmh.)
Number of hours per day flown per pilot		1.26 (87 minutes)	1.09 (66 minutes)
D. — *Revenue of enterprises :*			
Receipts from customers (A)	131,000,000 fr.	128,000,000 fr.	135,000,000 fr.
Receipts from subsidies (or lump sums)	432,000,000 fr.	442,000,000 fr.	420,000,000 fr.
Total revenue (B)	563,000,000 fr.	570,000,000 fr.	555,000,000 fr.
Ratio $P_2 = \frac{A}{B}$ (percentage of financial autonomy)	23.3%	22.4%	24.6%
E. — *Origin (approximate) of receipt from customers :*			
Receipts from passengers (millions of francs) ..	71.5 = 55%	67.5 = 52.7%	81 = 59%
Receipts from goods (millions of francs) ..	33.5 = 25.7%	30.5 = 23.8%	26 = 19%
Receipts from mails (millions of francs) ..	25.5 = 19.3%	30 = 23.5%	30 = 22%
Total receipts from Customers	130.5 = 100%	128 = 100%	137 = 100%

Hence these enterprises, with an aggregate capital of approximately 545 million francs, of which nearly one-fifth (107 millions) was paid by Governments, received direct annual subsidies of 500 million francs. The European States also include in their budgets, for the direct or indirect benefit of European public air transport enterprises, annual credits equivalent to at least 150 million francs. In these circumstances, it is not too much to say that contractual air transport has cost European taxpayers, in the territorial area under consideration alone, *2 thousand million French francs for the three years* 1930, 1931 *and* 1932.

If I were bold enough to estimate the expenditure incurred for the same purposes since 1919, this could hardly be put at less than 6 thousand million francs, especially if the heavy outlay on ground organisation, in which respect Germany has been particularly lavish, is taken into account. Professor PIRATH published the figure of 134 million RM. (approximately 820 million French francs) as representing Germany's expenditure since 1929 on the ground organisation of her system (air ports, communications, air beacons) alone.

No doubt these enormous sums will appear quite small if they are compared with the amount of capital invested in the railways or inland navigation, but attention must be paid to speed and the quantities of traffic produced. In this connection, it should be pointed out that the 12,400,000 ton-kilometres actually carried in 1932 by European contractual air transport enterprises, however impressive this figure may be, is equivalent to the load carried—each day of the year—by three or four ten-ton trucks for 1,000 kilometres—*i.e.*, from the north to the south of France or from London to Berlin. This small daily load represents a charge on the European budgets of nearly 2 million francs per day.

After fifteen years of efforts, organisation and technical progress, air transport in Europe still required in 1932 a subsidy of 14.50 francs per kilometre, while the receipts from customers per kilometre were 4.75 francs.

If subsidies are compared with ton-kilometres, the enterprises received, in 1932, 20.50 francs per ton-kilometre offered and 44.70 francs per ton-kilometre utilised.

I am aware that speed, which is sometimes important, is costly, but I consider that, with such resources, greater results might be aimed at, or that, if the companies are to be content with these small results, the cost could be very much less.

CHAPTER III.

ATTEMPT TO EXPLAIN THE RESULTS.

The general results obtained by the contractual air services in the territorial area under consideration therefore appear to be mediocre, whether from an absolute standpoint or in comparison with the results already obtained by American air transport undertakings across United States territory.

However, this low average must not cause me to lose sight of the remarkable results obtained in Europe by certain undertakings. On the contrary, the real problem is to find out *why it has not been possible for European undertakings in general to reach this high standard.*

1. Personnel.

The value of the personnel, both administrative and executive, is undisputed. They are selected from a large number of suitable candidates, who have served in the war or in existing air forces, and all are very keen on their work. The most that can be said is that their experience is very unequal, depending as it does on the nature, importance and geographical situation of the routes served. But that is not enough to explain the differences in results, which vary from 8 to 1.

2. Material.

It is obviously the material which is at fault, although—for several reasons—to a much smaller extent than would appear at first sight. To begin with, the technical methods of various countries, however different, may often be of the *same value* in spite of external differences; moreover, they are tending to become standardised, because undertakings copy each other by acquiring and exchanging patents and licences. Lastly, national undertakings, even when they are supplied by an important national industry, cannot all dispense with the products of foreign industries—for instance, in Italy, 57 per cent of the stock of machines at the beginning of 1933 still consisted of *Dornier*, *Junkers* and *Fokker* aeroplanes, the country having thitherto concentrated its efforts on the production of military material.

It is all the more natural that countries without an aeronautical industry have freely selected the most suitable material in the market. Certain comparatively small undertakings have thus done much to stimulate air transport by procuring in the United States the material which the European industry had as yet been unable or unwilling to produce. For instance, the " Swissair " were the first to import *Lockheed " Orion "* machines and the *Clark " G.A. 43 "* machine, and the enterprising Swedish firm " A.B.A. ", part of whose stock for 1934, as stated in 1933, consisted of the very fast single engine *Northrop " Delta "* aeroplanes.

In view of this comparative freedom in the choice of materials, it is interesting to see how the contractual air transport fleet in Europe was distributed on January 1st, 1933, as regards industries and technique employed :

(a) *Proportion obtained from Industries of Various Countries (Direct Supply or Transfer of Licence).*

			Per cent
Obtained from German manufacturers	238	machines [1]—*i.e.*,	37.7
,, ,, French ,, ...	168	,, ,,	26.6
,, ,, Netherlands ,, ...	142	,, [2] ,,	22.5
,, ,, Italian ,, ...	37	,, ,,	5.8
,, ,, British ,, ...	24	,, ,,	3.8
,, ,, Czechoslovak ,, ...	13	,, ,,	2.0
,, ,, American ,, ...	3	,, ,,	1.5
,, ,, Swiss ,, ...	3	,, ,,	1.5
,, ,, Russian ,, ...	2	,, ,,	1.5
,, ,, Polish ,, ...	1	,, ,,	1.5
	630	,, ,,	100

(b) *Exporting Capacity of the National Industries.*

Out of 142 Netherlands machines, 27 are used by the Netherlands K.L.M. and 115 (*i.e.*, 82.5 per cent) by companies of other nationalities.

Out of 238 German machines, 176 are used by German companies and 62 (*i.e.*, 26 per cent) by other companies.

Out of 168 French machines, 159 are used by French companies and 9 (*i.e.*, 5 per cent) by other companies.

Out of 24 British machines, 18 are used by British companies and 6 (*i.e.*, 25 per cent) by other companies.

Out of 37 Italian machines, 35 are used by Italian companies and 2 (*i.e.*, approximately 5 per cent) by other companies.

(c) *Diversity of Origin and Type.*

The 630 machines were supplied by 35 constructors; aeroplanes by 30 and seaplanes by 9.

The 168 French machines were obtained from 11 firms and are of 24 different types.

The 238 German machines from 6 firms—19 types.

The 142 Netherlands machines from 3 firms—13 types.

The 24 British machines from 5 firms—9 types.

The 37 Italian machines from 3 firms—6 types.

Altogether, irrespective of the different types of engines (which, however, lead to complications in the matter of supplies, replacement and upkeep), European air transport enterprises employ for the services under consideration 65 types of aeroplanes and 14 types of seaplanes. The engines are of 53 different types.

This variety makes the predominance of certain types all the more significant; thus, of the 162 *three-engine* and *four-engine* machines in service, there are 79 *Fokker*, of which 72 are of the *F.VII b* 3M type, 31 *Junkers* of the 20 "*G.24*" type, 15 *Farman* of the *F.*301 and similar types, and 14 *Rohrbach* "*Roland*"; the 23 other three-engine machines are divided among 9 different marks.

This analysis of the material in service shows that, in countries where no impediments exist in the form of subsidies or industrial protection, the actual use of

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[1] Including 127 *Junkers* machines.

[2] Including 139 *Fokker* machines.

material indicates a sort of consensus of opinion in favour of certain technical equipment which it would be interesting to analyse; but such a task is outside the scope of this report.

On the other hand, it is specially noteworthy that the enterprises with the highest return—the British, Netherlands and Finnish—depend to a very varying extent on their national industries.

Imperial Airways use British machines of a very high standard, but the industry has *as yet* no exporting capacity; the British company has chiefly encouraged the production of large machines excellently adapted to the traffic conditions on its lines.

The K.L.M. uses *Fokker* machines, although I understand that this constructor has no share in the capital of the contractual enterprise. Naturally, the fact that these machines are home-produced enables the Netherlands K.L.M. to obtain privileged treatment, since the constructor benefits by the experience gained in the operation of its lines, while the K.L.M. helps to determine the new types, and is also the first to employ them. It has thus been able on more than one occasion to resell under very favourable conditions material which is still capable of long service on less difficult lines or lines which are less exposed to competition than its own. These sales have a two-fold effect—which is very considerable—on the operation of the lines and on the financial administration of the company.

As there is no national industry in Finland, the Finnish enterprise " Aero O.Y. " goes to the firm which supplies the most suitable material for the lines it operates. Many other undertakings are in the same position; far from attaining the 61.4 per cent of " economic independence " (P_2 Index, see Chapter I) they reached (for instance, in 1932) 31.6 per cent (Swedish " A.B.A. "), 30 per cent (Danish " D.D.L. "), 26 per cent (Greek " E.E.E.S. "), 14.8 per cent (Spanish " L.A.P.E. "), or only 7.3 per cent (Polish " P.L.L. ").

3. The Effect of the Method of Subsidies.

I now have to examine the chief determining factors, one of which is without a doubt the method of assigning subsidies. It would, however, in my opinion, be going too far to place this first. I will give an imaginary example to support my view.

If Denmark decided to-morrow to establish and operate by herself a commercial air transport line between Copenhagen, Iceland and Greenland on grounds of affinity and long-standing colonial ties, the line would probably have a very low economic return at first. It would, in any case, fall very far short of the 30 per cent which the " D.D.L. " is at present able to obtain on a small system by means of a seasonal service operated jointly with Germany over a rich area well provided with free ground organisation.

Let us assume, however, that the Denmark-Greenland line is completed. The rates and subsidy system hitherto applied would then be of small account. The only problem would be how to operate a line which was less remunerative than the others; the State would still be called upon to " make up the difference ", and subsidies, whether granted in a lump sum or to each line, would have to be adapted to the economic return, which is the only thing that matters.

It is quite true that certain subsidy systems amount to a premium on technical slackness, while others may, on the contrary, afford a stimulus. It is important that the best system should be maintained, if it has to compete with the worst system. It is an economic axiom that " bad money drives out good "; this also applies to subsidy systems.

4. Programme and Value of Lines.

It seems to me, however, that the system of assistance adopted by any particular State, and which in the end amounts to a higher or lower rate of subsidy, *is an effect rather than a cause.* The enormous differences in the economic return which I have mentioned are due—primarily and above all—to the more or less ambitious nature of the programmes, the choice of lines, with their greater or lesser utility—in short, to the nature of the services, more or less genuine (or regarded by the public as such), which a commercial air transport enterprise claims to render on any particular route.

This conclusion tempts one to compare the various lines, to classify them according to their remunerativeness, and then to propose that some should be retained and others abolished. However, such an attempt is hopeless, first because the *present* value of the lines is very often due to the conditions of operation, both technical and political; the analysis of each particular case—if the data were available—would therefore lead me too far. I would merely point out, in order to show the complexity of the problem, that the actual value of a line at a given moment depends in particular on :

(a) The aeronautical possibilities of the route (climate, meteorology, facilities for landing grounds, suitability of the ground flown over for forced landings, etc.);

(b) The economic value of the communications ensured (centres linked up, importance of trade, etc.) ;

(c) The definite advantages procured (elimination of transhipment or multiple Customs formalities, duration of the through air journey—whether too tiring for passengers—saving of time, etc.).

In their turn, the conditions of operation (material employed, frequency and permanence of services, adjustment of time-tables to fit in with other means of transport, tariffs, insurance conditions, etc.) depend to a greater or less extent on the actual value of the line.

Lastly, competition may be all the keener the greater the subsidy and especially as it is more subject to unforeseen variations.

There can thus be no question, within the scope of this report, of strict *comparisons.* I have, however, considered it expedient to place certain *results side by side* and to comment on them in an impartial spirit.

Even in order to achieve this limited aim, a common measure was necessary. I first selected a measure which, if not the best, is at any rate the most obvious—namely, the *index of utilisation of the line.* This index is, of course, obtained by dividing by the length of a line in kilometres the quantity of ton-kilometres actually carried on that line in the course of a year ; it is therefore rather in the nature of an index of *activity* or of *traffic produced.*

5. Activity of Various Lines.

I have not attempted to classify the services enumerated below. It was not possible to examine all the lines, first because the traffic results *per line* have not been communicated and, secondly, because it is often impossible to form a correct estimate owing to the fact that several national services cover the same route, starting at different points. I have merely given a few examples arranged in diminishing order of their activity ; however, Paris-London must be considered separately, as its supremacy is unquestioned, and it would certainly take first place, even in a systematic survey.

Annual Number of Ton-Kilometres transported per Kilometre of Line.

A. *North-West Europe.*

(a) *Paris-London* (375 km.) in 1932 (two British companies, one French company ; several daily services all the year round, Sundays included) : 5,274 t.-km. per km. of line.

(b) *Amsterdam-London* (426 km.) in 1932 (one Netherlands company ; daily service all the year round, operated jointly for four months with the *Deutsche Lufthansa* ; these results have not been combined here) : 744 t.-km. per km. of line.

(c) *Paris-Brussels-Amsterdam* (440 km.) in 1932 (operated jointly by one Netherlands company and one French company ; daily service) : 623 t.-km. per km. of line.

(d) *Amsterdam-Malmö* (700 km.) in 1932 (one Netherlands company, with a daily service from April 1st to September 30th ; one Swedish company, with a daily service from March 1st to December 31st) : 543 t.-km. per km. of line.

(e) *London-Brussels-Cologne-Dusseldorf* (570 km.) in 1932 (daily service operated by a Belgian company over the whole route ; daily service—tri-weekly in winter—operated by a British company between London-Brussels-Cologne ; German daily service Cologne-Dusseldorf) : 540 t.-km. per km. of line.

(f) *Berlin-Hanover-Amsterdam-London* (991 km.) in 1931 (daily service operated by a German company) : 460 t.-km. of line.

(g) *Paris-Cologne-Berlin* (908 km.) (daily service operated jointly by a German company—1931 results—and a French company—1932 results) : 335 t.-km. per km. of line.

(h) *Paris-Marseilles* (730 km.) in 1932 (daily service operated by a French company) : 334 t.-km. per km. of line.

(i) *Berlin-Halle/Leipzig-Nuremberg-Munich* (527 km.) in 1931 (daily service operated by a German company) : 300 t.-km. per km. of line.

B. *Central Europe.*

(a) *Basle-Zurich-Munich-Vienna* (690 km.) (daily service for six months operated by a Swiss company over the whole route, 79 t.-km. ; German-Austrian service between Zurich-Munich, 41 t.-km. ; Austrian service Munich-Vienna, result unknown) : In all, probably 160 t.-km. per km. of line.

(b) *Prague-Leipzig-Essen-Rotterdam-Amsterdam* (893 km.) in 1932 (daily service for six months, operated by a Czechoslovak company) : 75 t.-km. per km. of line.

C. *Northern Europe.*

Stockholm-Turku-Helsinki (452 km.) in 1932 (daily service operated by a Finnish company for eight months and a Swedish company for four months) : 267 t.-km. per km. of line.

D. *Eastern Europe.*

(a) *Prague-Brno-Bratislava-Kosice-Uzhorod* (718 km.) in 1932 (daily service operated by a Czechoslovak company for seven and a-half months over the whole line and for eleven months between Prague and Bratislava) : 162 t.-km. per km. of line.

(b) *Warsaw-Katowice-Brno-Vienna* (661 km.) in 1932 (daily seasonal service, Warsaw-Katowice; tri-weekly permanent service Katowice-Vienna; a Polish company: 146 t.-km. per km. of line.

(c) The *Warsaw-Lwow-Cernauti-Bucarest-Sofia-Salonika* and *Cernauti-Galatz-Bucarest* system (2,350 km.) in 1932 (a Polish company; decreasing in frequency and becoming more seasonal from Warsaw-Lwow southwards) : 54 t.-km. per km. of line.

(d) *Belgrade-Skoplje-Salonika* (584 km.) in 1932 (a Yugoslav company; daily service for four and a-half months; operated jointly on some journeys with a French company) : 26 t.-km. per km. of line.

(e) *Bratislava-Zagreb* (320 km.) in 1932 (a Czechoslovak company; daily service for four and a-half months) : 11 t.-km. per km. of line.

E. *Southern Europe.*

(a) *Athens-Salonika* (370 km.) in 1932 (a Greek company; daily service all the year round) : 471 t.-km. per km. of line.

(b) *Barcelona-Madrid-Seville* (920 km.) in 1932 (a Spanish company; daily service, Sundays included, all the year round) : 292 t.-km. per km. of line.

(c) *Toulouse-Casablanca* (2,340 km.) in 1932 (a French company; daily service all the year round) : 205 t.-km. per km. of line.

(d) *Munich-Milan-Rome* (980 km.) in 1932 (an Italian company; daily or tri-weekly service for eleven months between variable points, according to season) : 163 t.-km. per km. of line.

(e) *Geneva-Marseilles* (310 km.) in 1931 (a German company) : 90 t.-km. per km. of line.

(f) *Venice-Ancona-Brindisi* (775 km.) in 1932 (an Italian company; bi- or tri-weekly service all the year round) : 21 t.-km. per km. of line.

F. *Mediterranean (seaplane lines).*

(a) *Marseilles-Tunis-Bône* (1,293 km.) in 1932 (a French company; daily service all the year round) : 162 t.-km. per km. of line.

(b) *Rome-Genoa-Marseilles-Barcelona* (1,190 km.) in 1932 (an Italian company; bi- or tri-weekly service all the year round) : 106 t.-km. per km. of line.

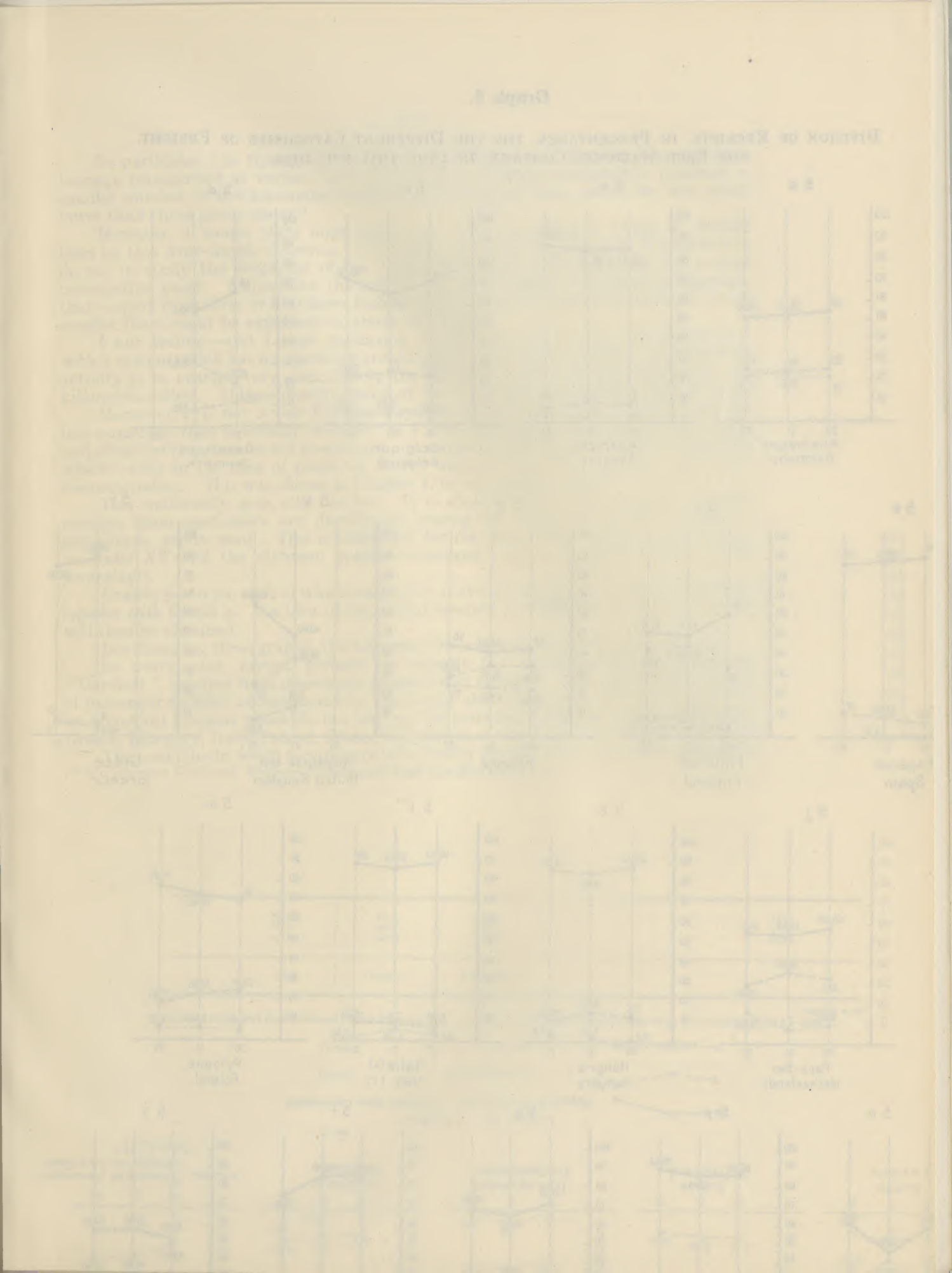
(c) *Rome-Syracuse-Malta-Tripoli* (1,225 km.) in 1932 (an Italian company; daily service for three months and tri-weekly the rest of the year) : 94 t.-km. per km. of line.

(d) *Brindisi-Athens-Istanbul* (1,437 km.) in 1932 (an Italian company; weekly service for five months and bi-weekly for six months) : 30 t.-km. per km. of line.

(e) *Marseilles-Algiers* (803 km.) in 1932 (a French company; daily service all the year round) : 28 t.-km. per km. of line.

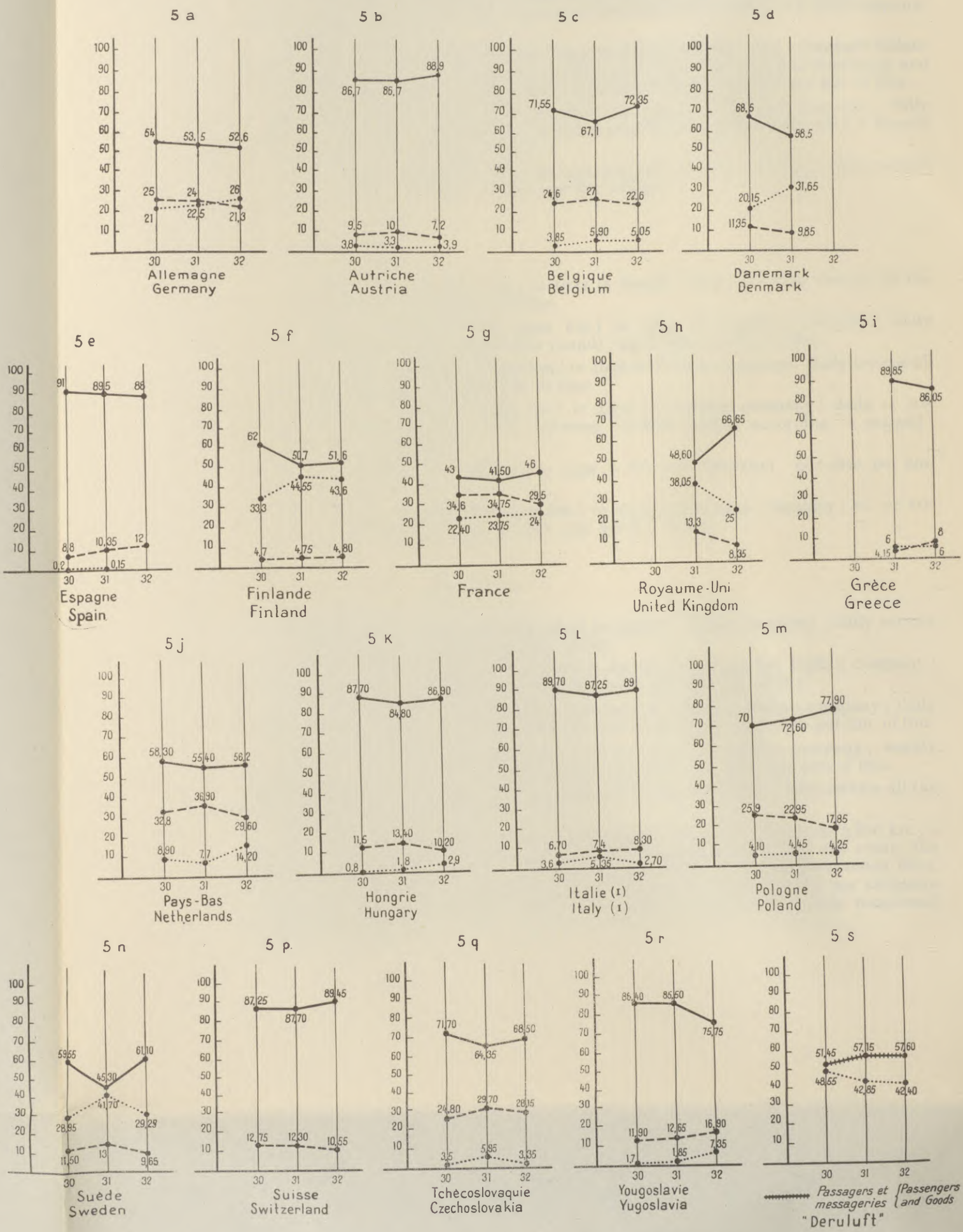
(f) The British bi-weekly service *London-Egypt* showed in 1932, over 3,600 km., a utilisation of 167 t.-km.; but, on the *Brindisi-Alexandria* portion of the route, the seaplane service must to-day be the most remunerative of the Mediterranean lines.

Thus, for the thirty lines examined, the activity in ton-kilometres per kilometre of line varies from 5,274 to 11. Even then I am not sure that I have mentioned the least active line.



Graph 5.

DIVISION OF RECEIPTS, IN PERCENTAGES, FOR THE DIFFERENT CATEGORIES OF FREIGHT, FOR EACH NATIONAL COMPANY, IN 1930, 1931 AND 1932.



Légende - Legend

Recettes de passagers – Receipts from passengers

" de messageries – " " goods

" postales – " " mail

(1) *Italy.*—The figures refer only to the lines included in the " main network ". The following are the percentages for the Italian network as a whole :

	Passengers	Goods	Mail
1930	81.24	4.65	14.11
1931	79.89	5.62	14.49
1932	79.95	9.01	11.04

In particular, the figures for " economic " activity—*i.e.*, showing the aggregate tonnage transported at various rates or even free of charge—reduced to represent a smaller number of ton-kilometres transported at the full rate, would be very much lower than those given above.[1]

However, I would state once again that I do not claim to judge or classify lines by this over-simple criterion. It would in any case be necessary, if I wished to do so, to study the evolution of the traffic and receipts for each line for several consecutive years. I also have the impression, after making certain investigations, that—apart from three or four lines, including Paris-London—the variations are much smaller than might be expected or, above all, desired.

I am dealing—and I shall endeavour to give the reasons for this assertion—with a system which has no elasticity and very little vitality as a whole; the kilometric activity is in nearly every case merely the quotient of the subsidy divided by the kilometric deficit. If the subsidy is reduced, the distance in kilometres will be reduced.

Moreover, it is not a vast European system operated jointly. The pools are far less numerous than is usually thought ; as a rule, national systems exist side by side and often overlap, but do not co-operate. A national enterprise in receipt of subsidies which—even in the case of pools—it shares with no one, soon acquires permanent characteristics. This was shown in *Chapter I*, in our *Graphs* 1 and 2.

This uniformity goes still further. It is shown even in the manner in which receipts from customers are distributed among the three categories of freight : passengers, goods, mail. This is indicated, for the three years 1930, 1931 and 1932, in *Table XV* and the eighteen *graphs* numbered 5-*a* to 5-*s*, *which merely express percentages.*

Graphs 5-*a* to 5-*s*, each of which relates to a national enterprise, should be examined *together with Graph* 2. An idea of the actual receipts to which the percentages apply will thus be obtained.

In examining these graphs, the following observations should be borne in mind :

In every case, except perhaps as regards the Germano-Russian enterprise " Deruluft ", receipts from passengers exceed other receipts. The highest percentages of passenger receipts accompanied by the lowest absolute receipts are to be found on air transport systems which do not link up the principal European markets (Austria, Greece, Hungary, Italy, Poland, Spain, Yugoslavia) or which are of a seasonal character.

The countries in which receipts are most evenly divided among the three categories of freight are Finland, France, Germany and the Netherlands.

The increase in goods receipts is particularly noticeable in France, Germany and the Netherlands.

Postal receipts are of great importance in the case of the Danish, Finnish and Swedish enterprises (influence of special services of night mail transport between Scandinavia and North-West Europe). The " Deruluft " has the advantage of a favourable postal contract.

6. Financial Return of Certain Lines.

In reality, a study of the financial return of each line is required ; but I have not the data at my disposal for this task. I have merely collected a few extreme results in *Table XVI* and shall next attempt to examine more closely a line which is

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[1] Although the figures for the ***absolute utilisation*** of the Italian official services are often very small, the figures for ***economic utilisation*** (free transport deducted) are also given for each line. The generalisation of this loyal practice is highly desirable, the notion of utilisation at full tariff being emphasised, as is done above.

Table XV.

RECEIPTS FROM EACH CLASS OF FREIGHT SHOWN AS A PERCENTAGE OF TOTAL RECEIPTS FROM CUSTOMERS.

Pays exploitant Operating country	Année 1930 — Year 1930 Pour 100 francs de recette de clientèle, on trouve Per 100 francs of receipts from customers			Année 1931 — Year 1931 Pour 100 francs de recette de clientèle, on trouve Per 100 francs of receipts from customers			Année 1932 — Year 1932 Pour 100 francs de recette de clientèle, on trouve Per 100 francs of receipts from customers		
	Passagers Passengers	Messageries et bagages Goods and baggage	Postes Mail	Passagers Passengers	Messageries et bagages Goods and baggage	Postes Mail	Passagers Passengers	Messageries et bagages Goods and baggage	Postes Mail
ALLEMAGNE — GERMANY	*54,—*	*25,—*	*21,—*	*53,50*	*24,—*	*22,50*	*52,60*	*21,35*	*26,05*
AUTRICHE — AUSTRIA. .	86,70	9,50	3,80	86,70	10,—	3,30	88,90	7,20	3,90
BELGIQUE — BELGIUM .	71,55	24,60	3,85	67,10	27,—	5,90	72,35	22,60	5,05
ROYAUME - UNI — UNITED KINGDOM . .	Pas de renseignements No information			*48,60*	*13,35*	*38,05*	*66,65*	*8,35*	*25,—*
DANEMARK — DENMARK	68,50	11,35	20.15	58,50	9,85	31,65			
ESPAGNE — SPAIN . . .	91,—	8,80	0,20	89,50	10,35	0,15	88,—	12,—	
FINLANDE — FINLAND .	62,—	4,70	33,30	50,70	4,75	44,55	51,60	4,80	43,60
FRANCE.	43,—	34,60	22,40	41,50	34,75	23,75	46,50	29,50	24,—
GRÈCE — GREECE . . .	Pas de trafic No traffic			89,85	4,15	6,—	86,—	8,—	62,—
HONGRIE — HUNGARY .	87,70	11,50	0,80	84,80	13,40	1,80	86,90	10,20	2,90
ITALIE — ITALY	*89,70*	*6,70*	*3,60*	*87,25*	*7,40*	*5,35*	*89,—*	*8,30*	*2,70*
PAYS-BAS — NETHERLANDS	58,30	32,80	8,90	55,40	36,90	7,70	56,20	29,60	14,20
POLOGNE — POLAND . .	70,—	25,90	4,10	72,60	22,95	4,45	77,90	17,85	4,25
ROUMANIE — ROUMANIA	Pas de trafic No traffic			Pas de trafic No traffic			Pas de renseignements No information		
SUÈDE — SWEDEN . . .	59,55	11,50	28,95	45,30	13,—	41,70	61,10	9,65	29,25
SUISSE — SWITZERLAND.	87,25	12,75	Paiement forfaitaire Lump sum payment	87,70	12,30	Paiement forfaitaire Lump sum payment	89,45	10,55	Paiement forfaitaire Lump sum payment
TCHÉCOSLOVAQUIE — CZECHOSLOVAKIA. . .	71,70	24,80	3,50	64,35	29,70	5,95	68,50	28,15	3.35
YOUGOSLAVIE — YUGOSLAVIA	86,40	11,90	1,70	85,50	12,65	1,85	75,75	16,90	7,35
U. R. S. S. (et ALLEMAGNE) (« Deruluft ») .	51,45		48,55	57,15		42,85	57,60		42,40
U.S.S.R. (and GERMANY) (« Deruluft ») .									

Table XVI.

Financial Results of the Traffic on Certain Lines for 1932.

Ligne ou réseau Line or network	Coefficient d'utilisation effective Coefficient of actual utilisation	Coefficient d'utilisation économique Coefficient of economic utilisation	Recette de clientèle (A) (en francs) Receipts from customers (A) (in francs)	Subvention absorbée (en francs) Subsidy absorbed (in francs)	Encaissement total (B) (en francs) Aggregate revenue (B) (in francs)	Indice P_2 $\left(\frac{A}{B}\right)$ d'autonomie financière P_2 index $\left(\frac{A}{B}\right)$ of financial autonomy	Observations relatives à l'exploitation Observations as to working
	%	%				%	
Réseau européen (val. moyenne). European network (average value).	46	35 env. app.	37.000.000	417.000.000	554.000.000	24.7	
Brindisi–Athènes-Athens–Istanbul (1.437 km.)	59,1	34,1	528.038	11.069.239	11.597.277	4,5	11 mois de service : hebdomadaire pendant 5 mois et bihebdomadaire pendant 6. 11 months' service : weekly for 5 months and bi-weekly for 6.
Rome–Syracuse–Malte-Malta–Tripoli (1.225 km.).	63	54,1	718.900	9.353.500	10.072.400	7,1	12 mois de service : quotidien pendant 3 mois, et trihebdomadaire pendant 9. 12 months' service : daily for 3 months and tri-weekly for 9.
Rome — Gênes-Genoa–Marseille – Barcelone-Barcelona (1.190 km.)	27,6	20	206.050	11.609.000	11.815.050	1,8	Service bi- ou trihebdomadaire. Bi- or tri-weekly service.
Munich – Milan – Rome (980 km.).	41,7	33,3	852.800	9.808.500	10.661.300	8	Service quotidien ou trihebdomadaire pendant 11 mois, sur parcours saisonniers variables. Daily or tri-weekly service for 11 months, between places varying according to season.
Venise-Venice — Ancône-Ancona — Brindisi (775 km.)	34,9	20	18.369	2.115.100	2.133.469	0,85	Service bi- ou trihebdomadaire. Bi- or tri-weekly service.
Marseille–Tunis – Bône (1.293 km.)	90	?	2.318.932	17.666.924	19.985.856	11,5	Service quotidien toute l'année (sauf dimanches).
Marseille – Alger-Algiers (803 km.)	33	?	908.432	15.861.500	16.769.932	6	Daily service all the year round (Sundays excepted).
Paris — Londres-London (Air Union).	76	?	8.554.494	10.000.000	18.554.494	46,1	Services pluriquotidiens, toute l'année, dimanches compris.
Londres-London – Paris (Imperial Airways). . . .	70 (?)	?	13.666.950 (?)	4.250.000 (?)	17.916.950	76,3	Several services daily, all the year round, Sundays included.

The *lira* is reckoned at 1 fr. 30.

unfortunately a unique one of its kind in Europe : Paris-London. I shall thus indicate the most striking variations from the average results included in *Table XIV (Chapter II)*.

I regret that these variations in an unfavourable sense nearly all relate to the Italian system. That is doubtless due to the nature of things ; but it is only brought out here on account of the accurate manner in which the Italian authorities have replied to the basic questionnaire.

Thus, for Italian lines in the Mediterranean, which have coefficients of actual utilisation varying from 27 to 59 per cent and coefficients of economic utilisation varying from 20 to 54 per cent, the economic independence indices are between *less* than 1 per cent and 7 per cent.[1] It must therefore be concluded that a large part of the traffic included under economic utilisation is still granted very reduced rates. Otherwise, I should have to assume that, for instance, an aeroplane *travelling with a full load* from Venice to Brindisi would obtain less than 5 per cent [2] of the total revenue which it procures for the company from receipts from customers.

* * *

Paris-London offers a striking contrast to these lines which, from an economic standpoint, are very unsatisfactory. I will, therefore, examine this line.

7. A Short Line with a High Return : Paris-London in 1932.

As regards their European system, Imperial Airways do not publish statistics for each line separately. The following traffic results for 1932 have, however, been taken from an official document issued by the United Kingdom Air Ministry, comparing the results of the British and French undertakings since 1928, between London and Paris. Moreover, the Air Union results for 1932 conform strictly to the French official statistics.

For the two competing companies, the figures are as follows :

	Air Union	Imperial Airways
Kilometres flown	960,397	729,121
Number of passengers	14,633	36,308
Goods (in tons)	582	384
Mail (in tons)	8.7	24.73
Passenger-km.	5,487,375	13,614,661
Ton-km. Passengers (1 passenger = 80 kg.)	438,984	1,089,200
Ton-km. Goods	218,165	143,978
Ton-km. Mail	3,255	9,272
Total	660,404 t.-km.	1,242,450
Utilisation	76%	? %

On the 375 km. of the Paris-London line, nearly 2 million t.-km. were thus *utilised* in 1932 (passengers, 1,528,000; goods, 362,000; mail, 12,500 t.-km.). This is equivalent to one-sixth of the total quantity utilised, for Europe as a whole, by the contractual services.

Taken by itself, the Paris-London line thus shows more *t.-km. utilised* than the whole of the systems operated by the Belgian, Swiss, Czechoslovak, Polish, Swedish,

[1] The 1933 results brought the maximum Italian rates for the three lines in question up to 2.4% and 15%.

[2] According to the 1933 results, this would have to read : " less than 10% ".

Danish, Finnish, Austrian, Hungarian, Yugoslav and Roumanian companies put together (1,902,854 t.-km., as compared with approximately 1,850,000).

In 1932, the Air Union, although it secured only about one-third of the Paris-London traffic (660,404 t.-km., as compared with 1,242,450 secured by the Imperial Airways), equalled *on a line 375 km. long* the quantities of freight (in t.-km. utilised) shown by the C.I.D.N.A. and Farman lines on 8,374 km. of lines. Similarly, the traffic receipts amounted to 8,554,494 francs for the Paris-London line (Air Union) and to 9,128,548 francs for the Farman-C.I.D.N.A. European lines as a whole.

Hence, the traffic produced, *per kilometre of line*, compares as follows :

	Per kilometre of line.	
	T.-km. utilised	Receipts from customers
		Francs
Paris-London (Air Union)	1,760	22,810
Farman and C.I.D.N.A. systems combined	79	1,090

It is interesting to compare with these figures the State subsidies per kilometre flown :

Paris-London (Air Union) 1932, 10 million francs for 960,397 km.—*i.e.*, 10.40 francs per km.

Farman and C.I.D.N.A. systems (1932), 44,500,000 francs for 2,194,878 km.—*i.e.*, 20.25 francs per km.

Consequently, while the " production " per km. of line (both in t.-km. and in receipts from customers) is twenty-two times greater on the Paris-London line (French management) than on the continental system C.I.D.N.A.-Farman, the kilometric subsidies vary only in the proportion of from 1 to 2, and the receipts per t.-km. utilised (if not sold) amount to 12.90 francs on the Paris-London line and to 13.80 francs on the continental system under consideration.

The much more frequent utilisation and the very much greater production (which are, in fact, quite exceptional) of the Paris-London line have, therefore, had no effect on tariffs. Here we have a French line with a return of 76 per cent, whose activity is enormous as compared with that of the continental system, and which has nevertheless absorbed 10.40 francs subsidy per kilometre flown.

It would be very interesting to compare the financial situation of the Air Union Paris-London line with that of the Imperial Airways. Unfortunately, the British Government was not in a position to communicate to the League of Nations particulars of receipts from customers. We may, however, venture to give an approximate estimate based on the aggregate receipts officially communicated for the period April 1st, 1932, to January 31st, 1933—namely, £951,492, of which £458,000 represented subsidies. The receipts from customers would thus have amounted to £493,492, corresponding to an effective traffic of 1,860,317 ton-miles, the receipts in question amounting to roughly 12.60 francs per ton-kilometre—a figure which approximates very closely to the Air Union's receipts from the Paris-London line—namely, 12.90 francs. However, in order to take into account the small proportion of the most remunerative freight—namely, mail—on the London-Paris line (although the Imperial Airways receive a very low fee for mail transport), I will assume that receipts from customers amount to 11 francs per ton-kilometre utilised—*i.e.*, 13,666,950 francs in 1932. These aggregate receipts represent a return from customers of 18.75 francs per

kilometre flown, which ought to cover the portion of the traffic costs corresponding to utilisation.

In other words, if a British aeroplane from Paris-London was loaded to 75 per cent of its capacity in 1932, 75 per cent of its expenses would be covered. If we assume an average utilisation of 70 per cent, which is slightly under that of the Air Union, whose machines are much smaller, the British service between London and Paris probably absorbed in 1932 a subsidy of from 5 to 6 francs per kilometre flown—*i.e.*, roughly 4,250,000 francs. For the European system as a whole (London-Egypt line excluded), on which Imperial Airways covered a distance of 1,057,200 kilometres, the Company received £110,000 in subsidies—*i.e.*, 9,350,000 francs. Each of the 280,000 kilometres flown elsewhere than on the Paris-London line would, therefore, have been able to absorb 18 francs subsidy per kilometre, a sum which was largely in excess of the requirements.

Consequently, thanks to the London-Paris line, Imperial Airways were able to earn money on their European system in 1932. Judging by the available data for 1933, this situation has improved still further. It should also be noted that the competition of an unsubsidised enterprise, the Hillman service, has increased the general total by a small percentage without doing any harm to either of the two contractual companies.

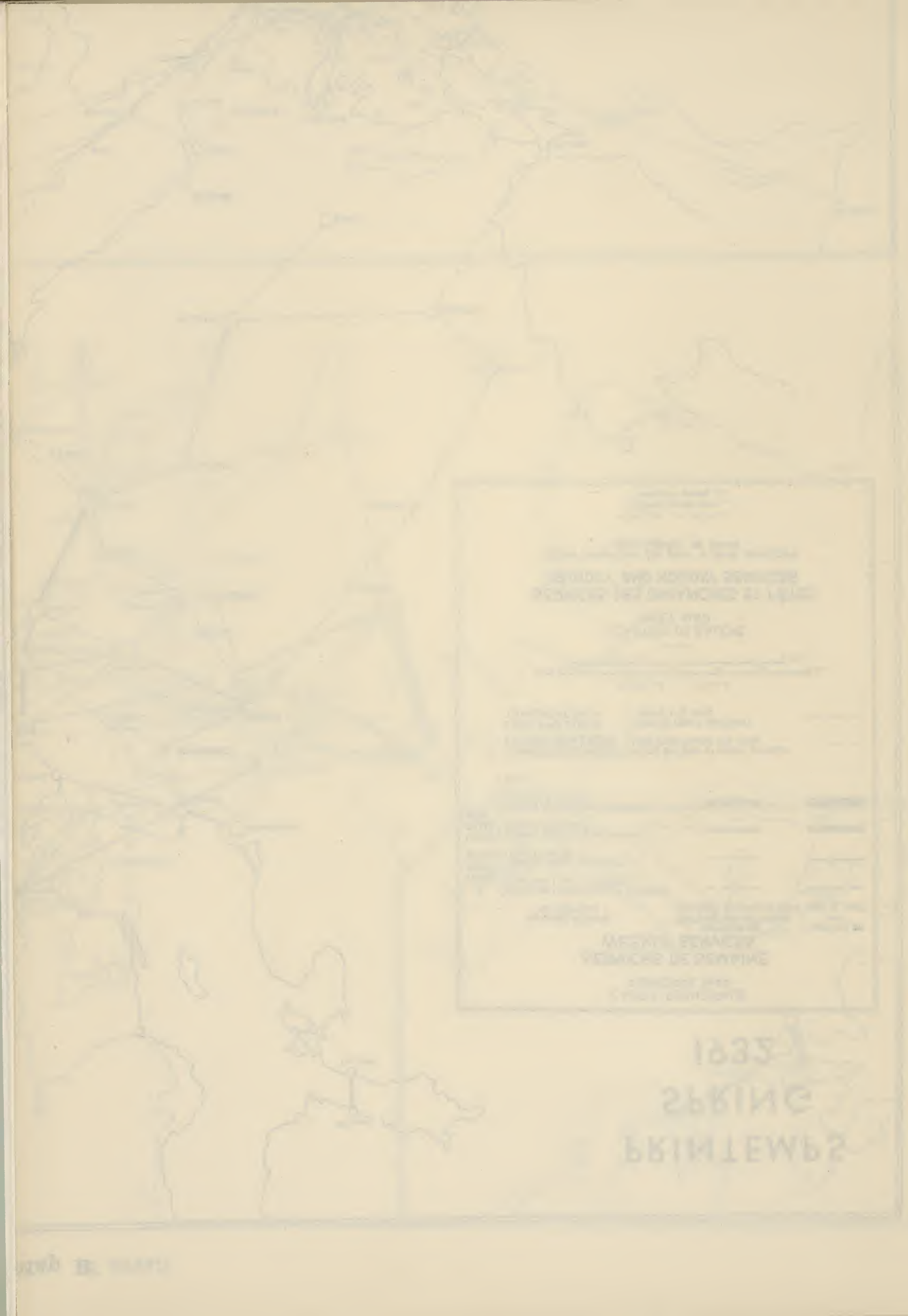
8. Seasonal Nature of the Services.

The *observations* column of *Table XVI* is particularly interesting. It shows that the index of financial autonomy of the services, which depends on receipts alone, is obviously influenced by their regularity, frequency and seasonal or permanent nature. This fact would be brought out still more clearly if the *table* covered all the lines of the European system. In fact, these interruptions and irregularities in the services constitute the most marked characteristic of air transport enterprises in Europe, especially as compared with the permanent services in the United States. That is probably the main reason of their obvious inferiority.

I have, accordingly, prepared for 1932 four *maps—B, C, D* and *E*—showing the services provided under the so-called *spring, summer, autumn* and *winter* time-tables. These maps cannot claim to be absolutely accurate, as the time-tables throughout Europe are by no means changed simultaneously. They should be regarded as pictures, which are more striking and more complete than the maps usually published. Special attention should be paid to the diagram of *Sunday* services included in each map. One cannot help being struck by the fact that, in practice, air transport services run only on weekdays, in the seasons when they operate, as if the enterprises seized every opportunity, good or bad—and in this case they are all bad—to suspend services, which are evidently onerous, on Sundays and in many cases on holidays. Under these conditions, it is hard for the public to regard air transport as a normal means of public transport. It is still more difficult when the services are suspended for three, six or even nine months. After this lengthy interruption, the advertising efforts of the commercial services have to be begun again, as in the case of a new enterprise. Customers have had time to forget the services, even if they be of real value, which air transport claims to render.

This question is of great importance. I will therefore give a few examples to illustrate the seasonal and irregular character of contractual air transport in Europe.

* * *



Carte B — Map B

PRINTEMPS
SPRING
1932

CARTE PRINCIPALE
PRINCIPAL MAP

SERVICES DE SEMAINE
WEEKLY SERVICES

		Services Aériens Air Services	Services de Compagnies nationales Services by National Comp	Services en "pool" Serv by "pool"
A TRANSPORTS MIXTES	Moins de 1 aller et retour quotidien Less than 1 round trip daily		– – – –	– – – –
	1 aller et retour quotidien 1 round trip daily		———	———
MIXED TRANSPORT	2 allers et retours quotidiens 2 round trips daily		═══	═══
	3 allers et retours quotidiens 3 round trips daily		═══	═══
	etc....			
B TRANSPORT DE POSTE ET FRET SEULEMENT	Moins de 1 aller et retour quotidien Less than 1 round trip daily			.....
MAIL AND GOODS TRANSPORT ONLY	1 aller et retour quotidien 1 round trip daily			—·—·—

ECHELLE — SCALE

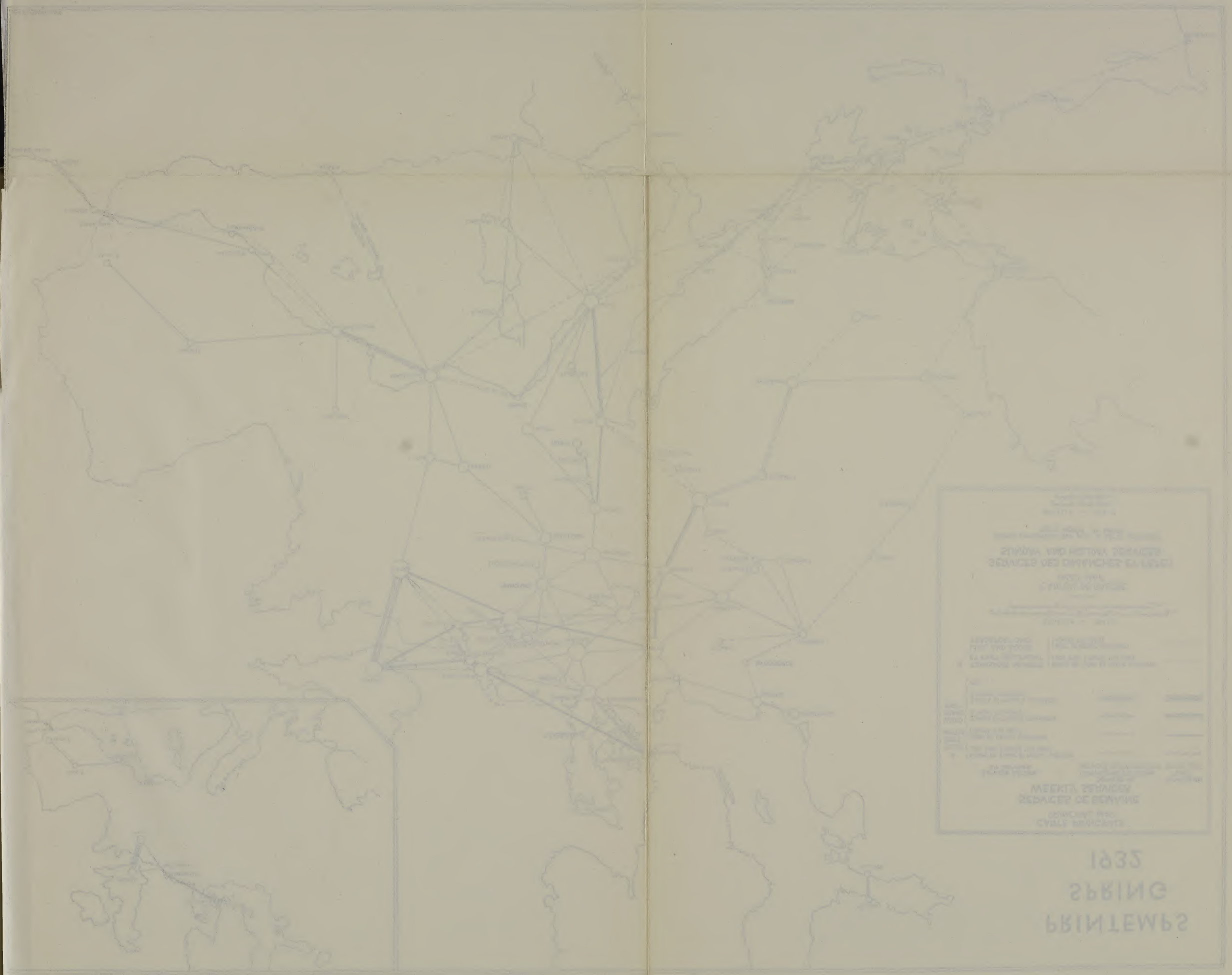
CARTON DE GAUCHE
INSET MAP

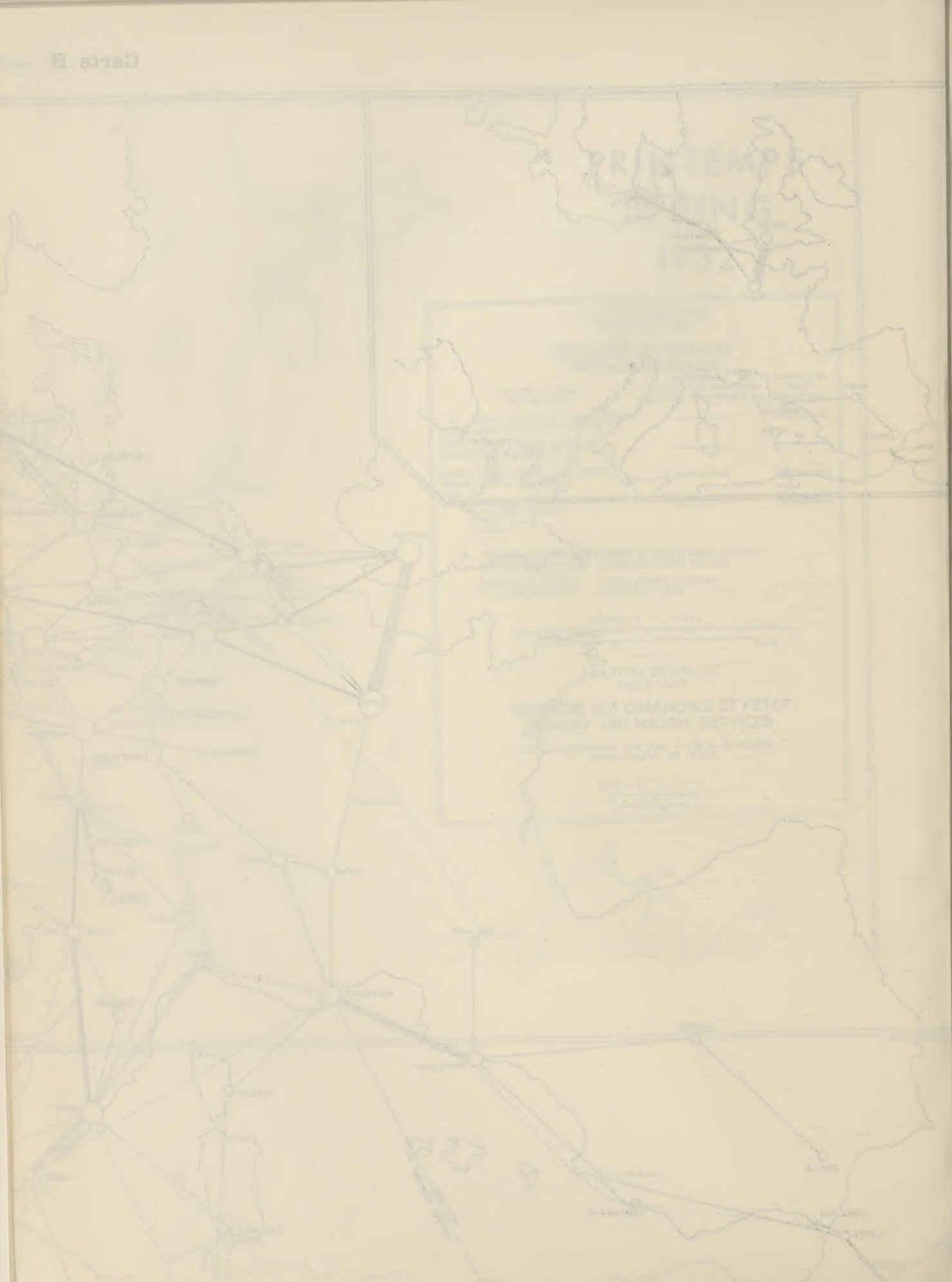
SERVICES DES DIMANCHES ET FÊTES
SUNDAY AND HOLIDAY SERVICES

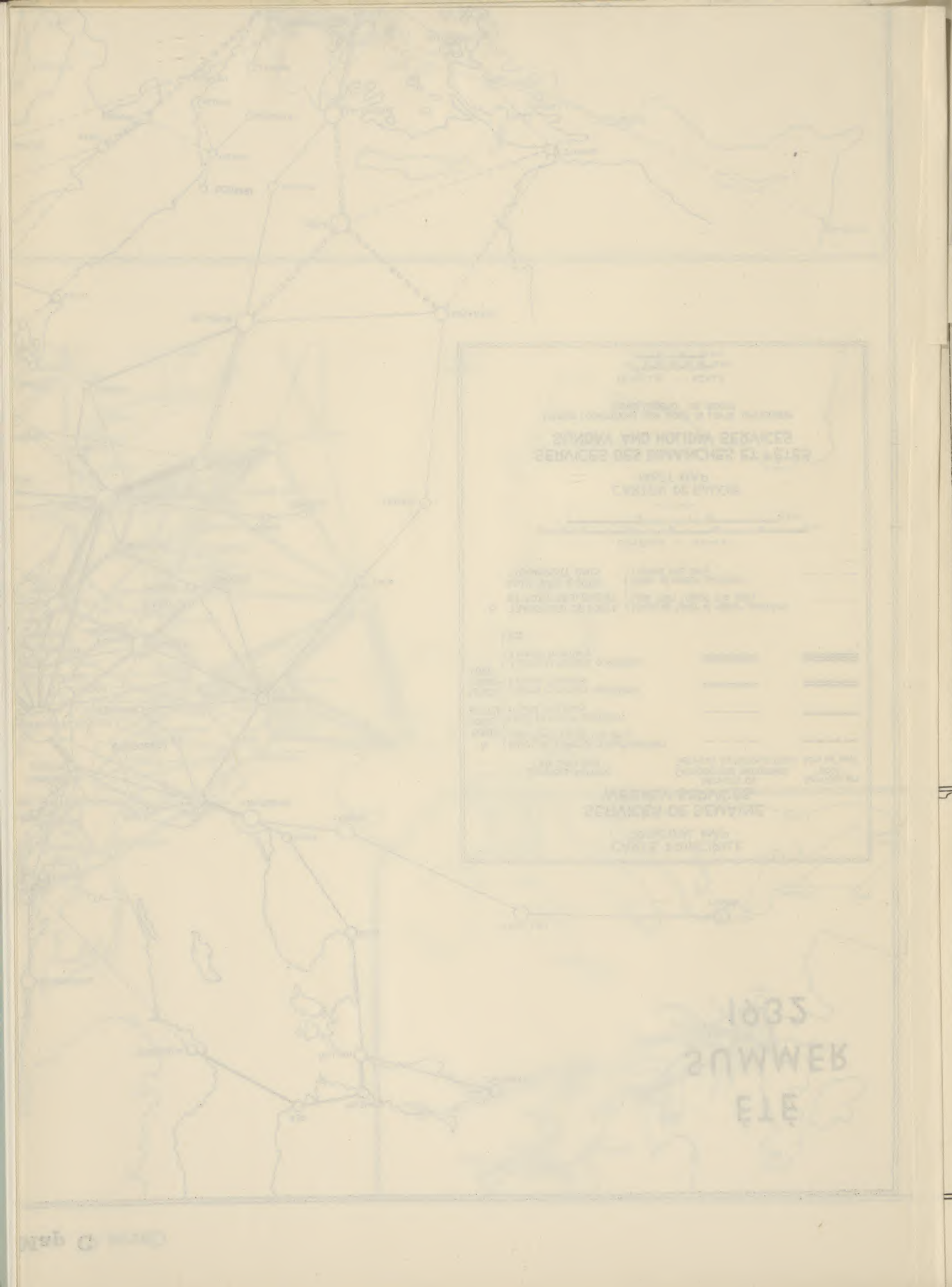
Mêmes conventions que pour la carte principale
Same Legend as above

ECHELLE — SCALE

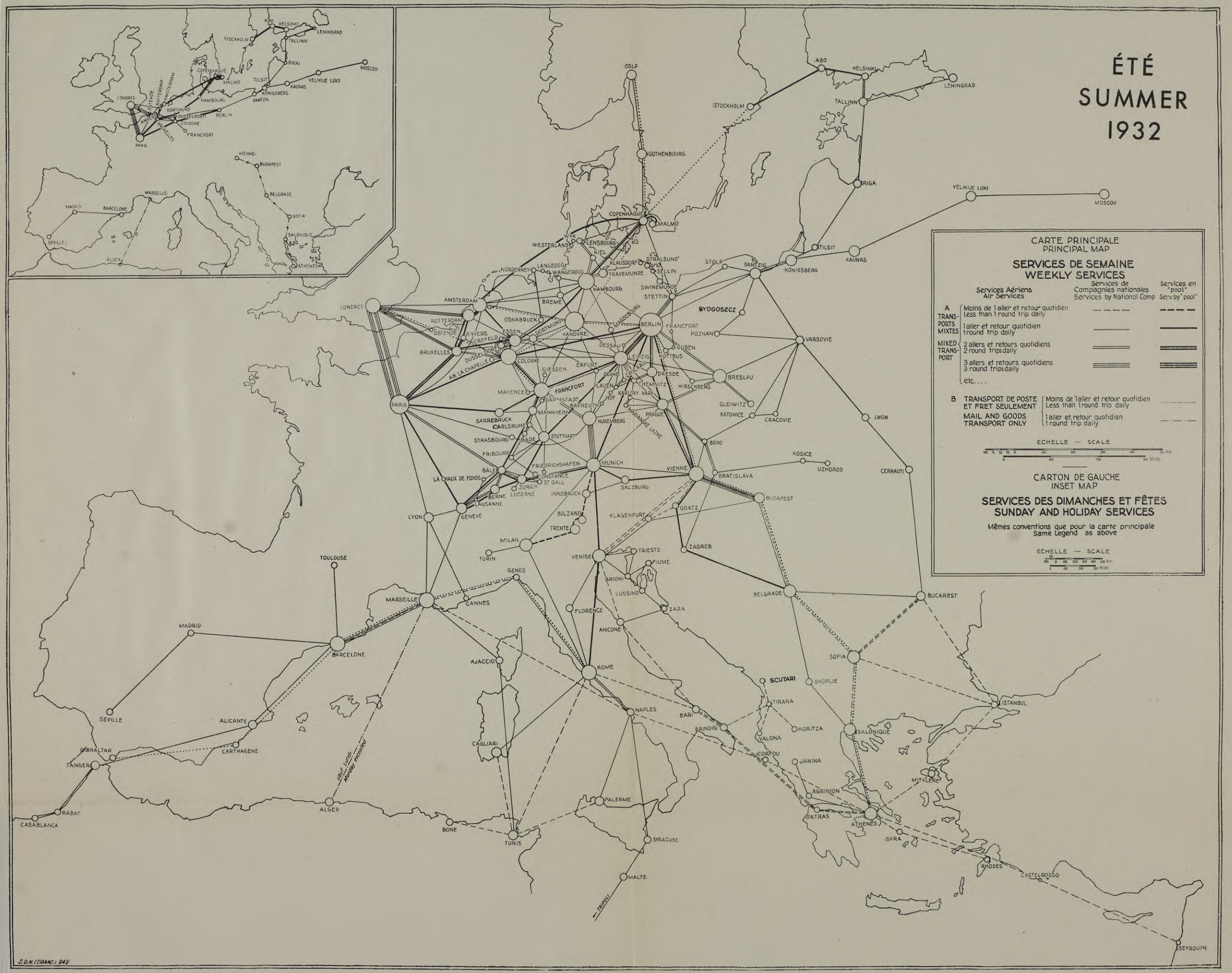
S.D.N. (TRANS.) 948







Carte C — Map C



ÉTÉ SUMMER 1932

CARTE PRINCIPALE
PRINCIPAL MAP

SERVICES DE SEMAINE
WEEKLY SERVICES

		Services Aériens Air Services	Services de Compagnies nationales Services by National Comp	Services en "pool" Serv by "pool"
A TRANSPORTS MIXTES	Moins de 1 aller et retour quotidien / Less than 1 round trip daily		— — — —	— — — —
	1 aller et retour quotidien / 1 round trip daily		———	———
MIXED TRANSPORT	2 allers et retours quotidiens / 2 round trips daily		═══	═══
	3 allers et retours quotidiens / 3 round trips daily		═══	═══
	etc....			
B TRANSPORT DE POSTE ET FRET SEULEMENT / MAIL AND GOODS TRANSPORT ONLY	Moins de 1 aller et retour quotidien / Less than 1 round trip daily			.....
	1 aller et retour quotidien / 1 round trip daily			— · — · —

ECHELLE — SCALE

600 75 50 25 0 400 200 300 400 500 Km
0 100 200 300 Miles

CARTON DE GAUCHE
INSET MAP

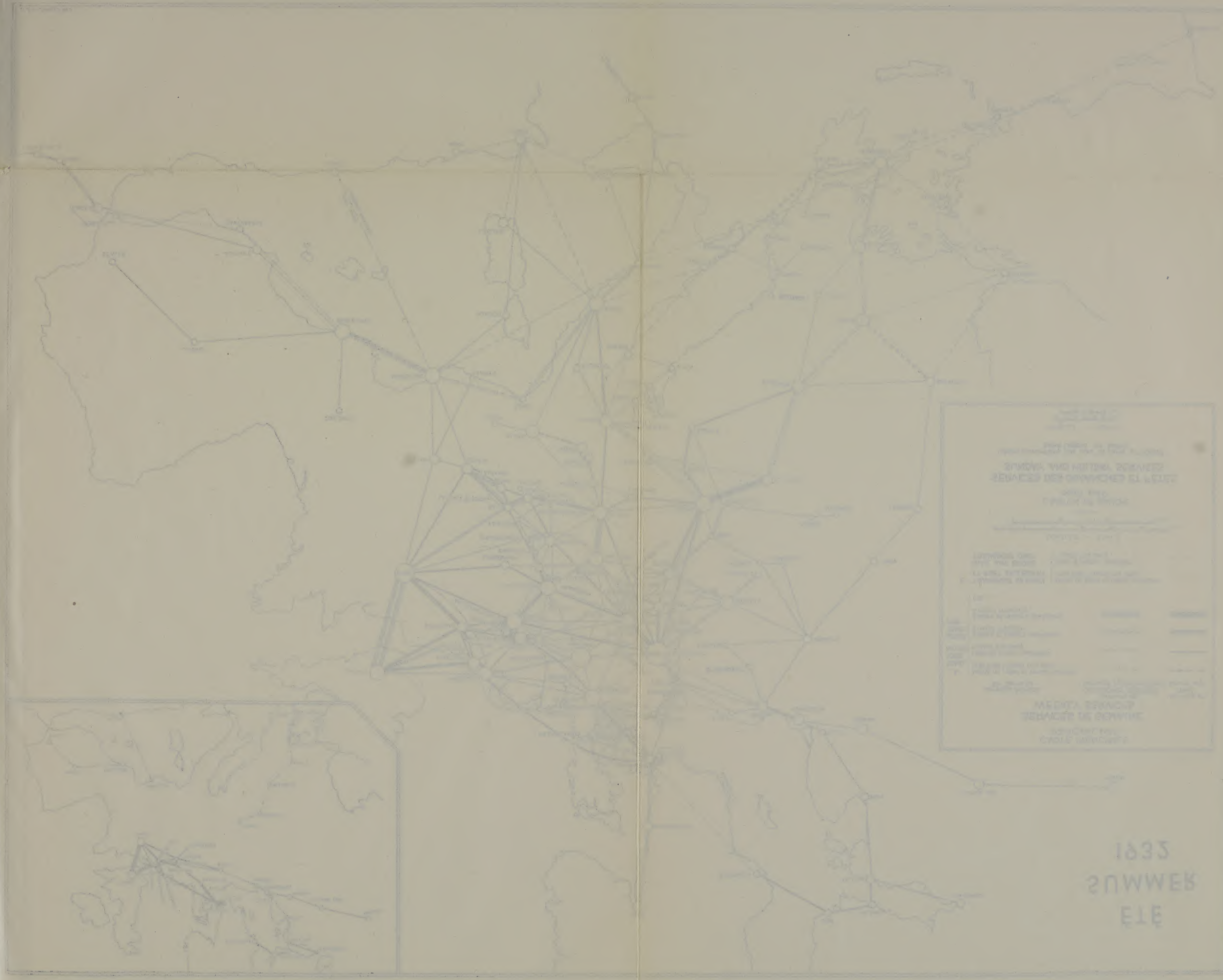
SERVICES DES DIMANCHES ET FÊTES
SUNDAY AND HOLIDAY SERVICES

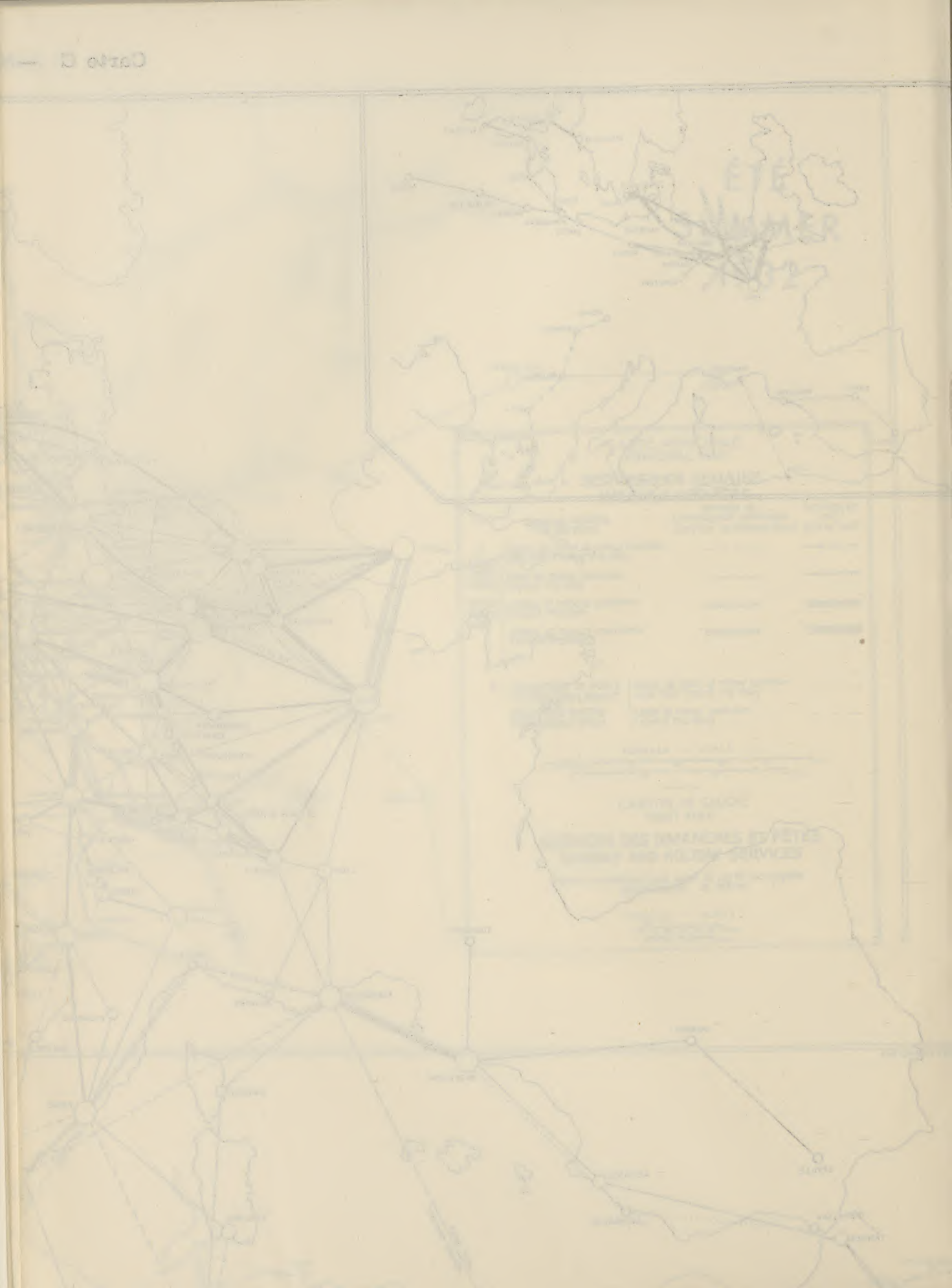
Mêmes conventions que pour la carte principale
Same Legend as above

ECHELLE — SCALE

100 0 100 200 300 400 500 Km
0 100 200 300 Miles

S.D.N. (TRANS.) 949





AUTOMNE
AUTUMN
1932

CARTE PRINCIPALE
PRINCIPAL MAP

SERVICES DE SEMAINE
WEEKLY SERVICES

		Services Aériens Air Services	Services de Compagnies nationales Services by National Comp.	Services en "pool" Serv by "pool"
A TRANSPORTS MIXTES	Moins de 1 aller et retour quotidien / Less than 1 round trip daily		— — — —	— — — —
	1 aller et retour quotidien / 1 round trip daily		———	———
MIXED TRANSPORT	2 allers et retours quotidiens / 2 round trips daily		═══	═══
	3 allers et retours quotidiens / 3 round trips daily		═══	═══
	etc....			
B TRANSPORT DE POSTE ET FRET SEULEMENT / MAIL AND GOODS TRANSPORT ONLY	Moins de 1 aller et retour quotidien / Less than 1 round trip daily		.....	
	1 aller et retour quotidien / 1 round trip daily		—·—·—	

ECHELLE — SCALE

600 Km 75 50 25 0 100 200 300 400 500 Km
0 100 200 300 Miles

CARTON DE GAUCHE
INSET MAP

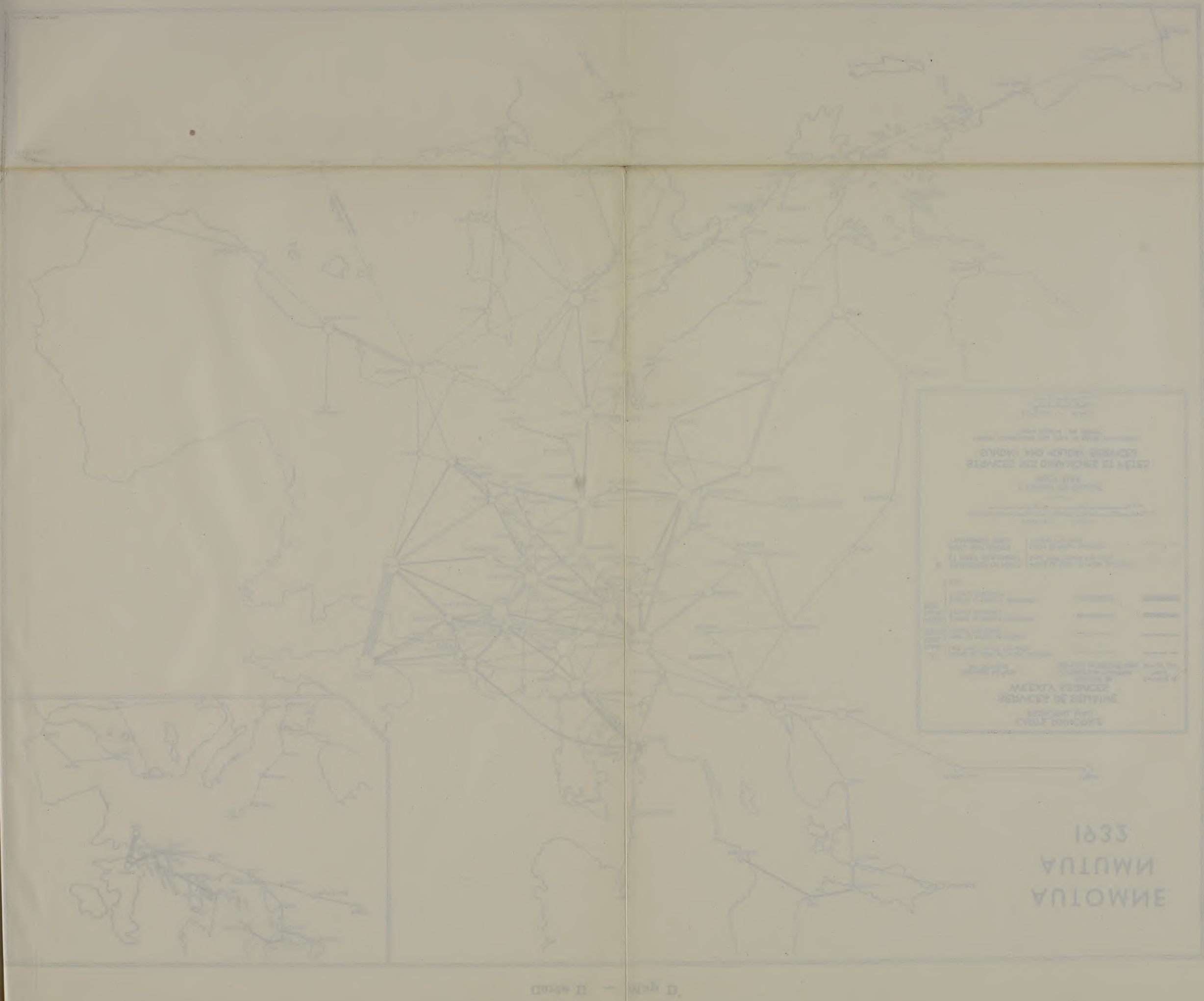
SERVICES DES DIMANCHES ET FÊTES
SUNDAY AND HOLIDAY SERVICES

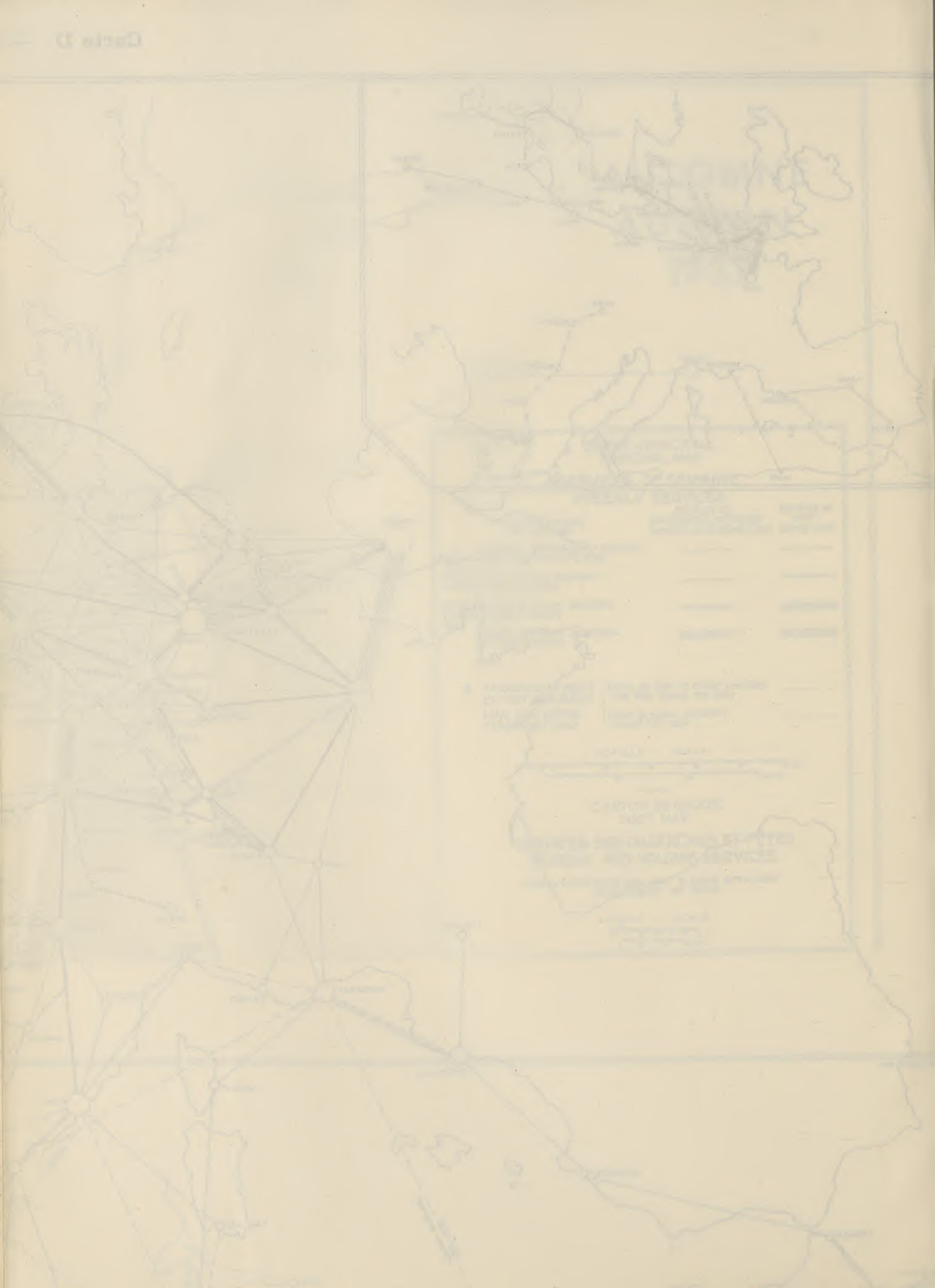
Mêmes conventions que pour la carte principale
Same Legend as above

ECHELLE — SCALE

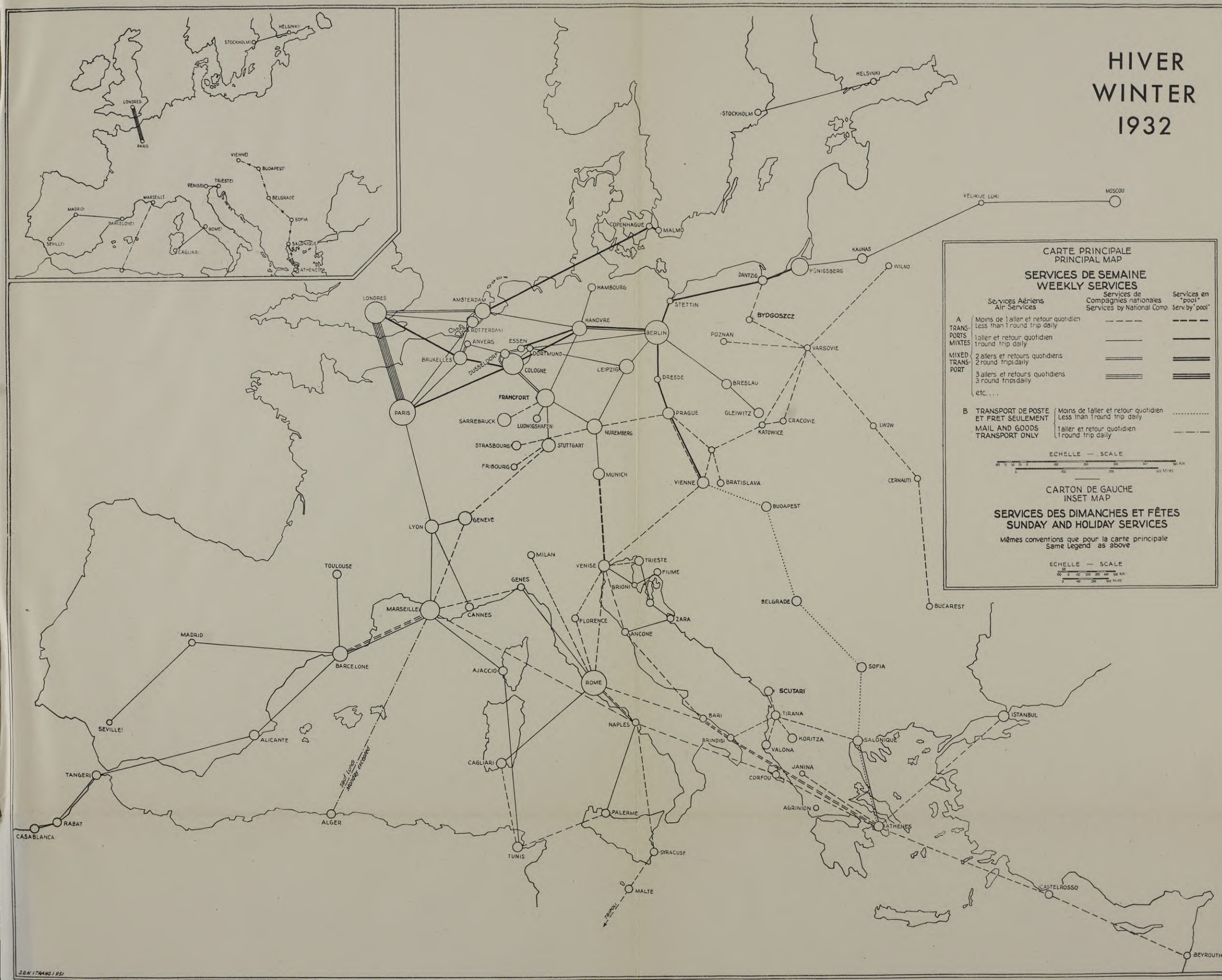
50 100 0 100 200 300 400 500 Km
0 100 200 300 Miles

S.D.N. (1704/XI) 950





Carte E — Map E


HIVER
WINTER
1932
CARTE PRINCIPALE
PRINCIPAL MAP
SERVICES DE SEMAINE
WEEKLY SERVICES
Services Aériens
Air Services
Services de Compagnies nationales
Services by National Comp.
Services en "pool"
Serv. by "pool"
A TRANSPORTS MIXTES
MIXED TRANSPORT
Moins de 1 aller et retour quotidien
Less than 1 round trip daily
1 aller et retour quotidien
1 round trip daily
2 allers et retours quotidiens
2 round trips daily
3 allers et retours quotidiens
3 round trips daily
etc....
B TRANSPORT DE POSTE ET FRET SEULEMENT
MAIL AND GOODS TRANSPORT ONLY
Moins de 1 aller et retour quotidien
Less than 1 round trip daily
1 aller et retour quotidien
1 round trip daily
ECHELLE — SCALE
CARTON DE GAUCHE
INSET MAP
SERVICES DES DIMANCHES ET FÊTES
SUNDAY AND HOLIDAY SERVICES
Mêmes conventions que pour la carte principale
Same Legend as above
ECHELLE — SCALE
HELSINKI
STOCKHOLM
LONDRES
PARIS
VIENNE
BUDAPEST
TRIESTE
VENISE
BELGRADE
MARSEILLE
MADRID
BARCELONE
SEVILLE
ROME
CAGLIARI
SOFIA
SALONIQUE
ATHENES
COPENHAGUE
MALMO
VELIKIJE LUKI
MOSCOU
KAUNAS
KÖNIGSBERG
WILNO
DANTZIG
HAMBOURG
AMSTERDAM
ROTTERDAM
ANVERS
BRUXELLES
ESSEN
DORTMUND
DUSSELDORF
COLOGNE
HANOVRE
STETTIN
BERLIN
BYDGOSZCZ
POZNAN
VARSOVIE
LEIPZIG
DRESDE
BRESLAU
FRANCFORT
SARREBRUCK
LUDWIGSHAFEN
NUREMBERG
PRAGUE
GLEIWITZ
CRACOVIE
LWOW
KATOWICE
STRASBOURG
STUTTGART
FRIBOURG
MUNICH
VIENNE
BRATISLAVA
BUDAPEST
CERNAUTI
LYON
GENEVE
MILAN
VENISE
TRIESTE
FIUME
BRIONI
ZARA
TOULOUSE
GENES
MARSEILLE
CANNES
FLORENCE
ANCONE
BELGRADE
BUCAREST
MADRID
BARCELONE
AJACCIO
ROME
SOFIA
SCUTARI
SEVILLE
ALICANTE
NAPLES
BARI
TIRANA
ISTANBUL
BRINDISI
KORITZA
SALONIQUE
VALONA
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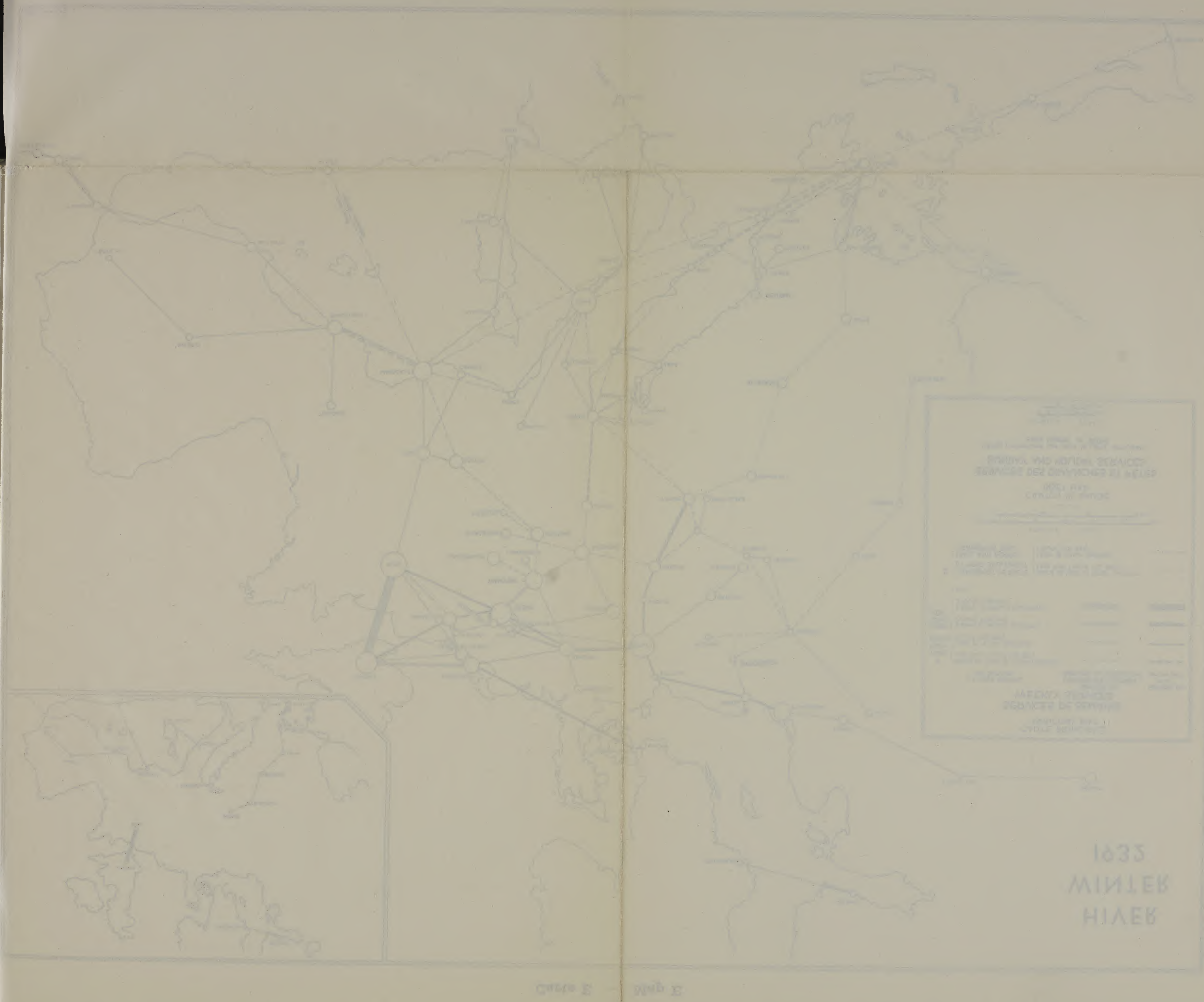
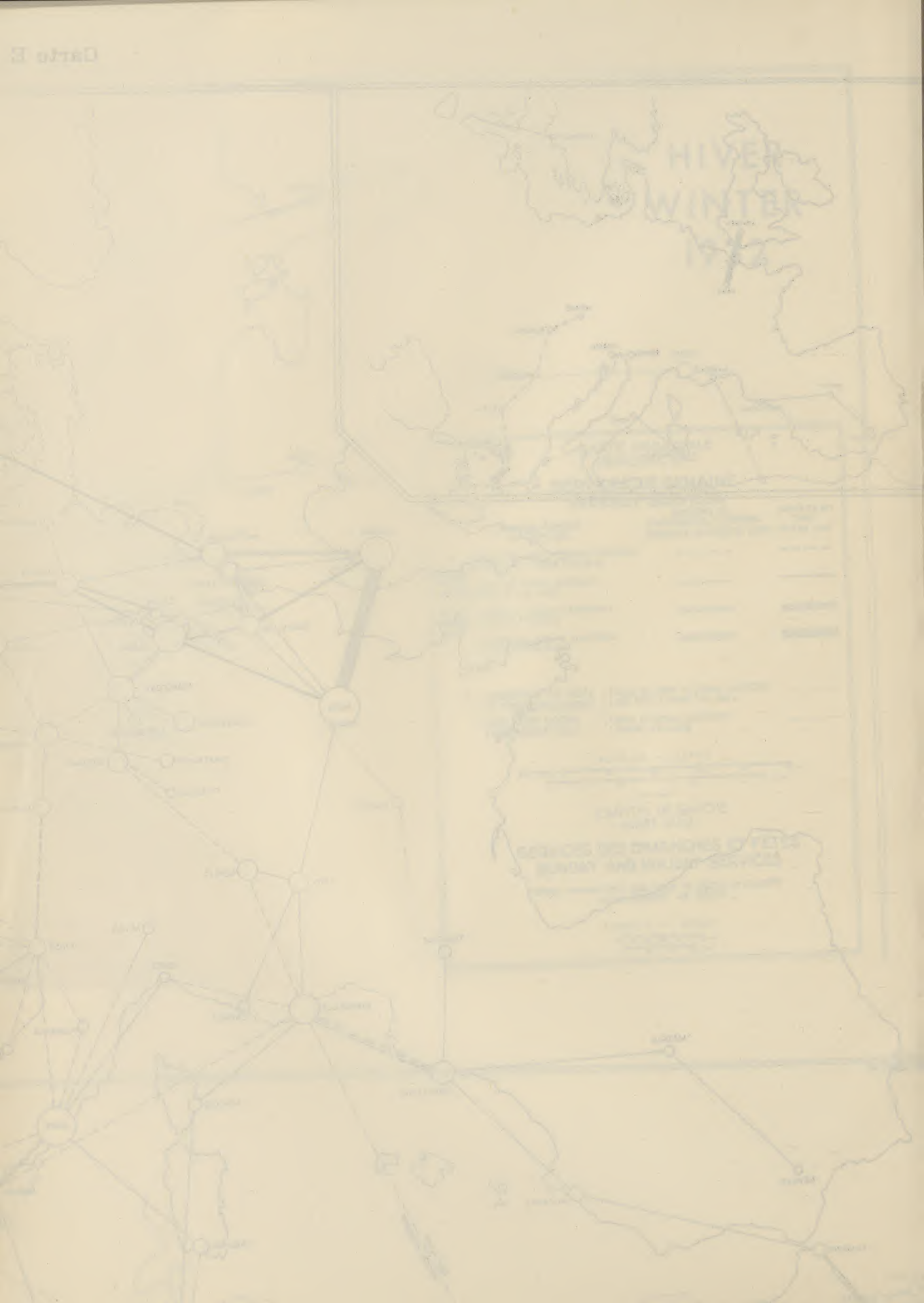
CORFOU
AGRINION
ATHENES
TANGER
RABAT
CASABLANCA
ALGER
PALERME
TUNIS
SYRACUSE
MALTE
CASTELROSSO
BEYROUTH
TRIPOLI
sauf lundi
Monday excepted




HIVER
WINTER

In the first place, if a service on a given route is to be described as *regular, one journey* at least should be made *daily in each direction.* This appears to be necessary, at all events in the part of Europe situated west of a line Helsinki-Warsaw-Budapest-Trieste-Corfu.

The Belgian services, on a system of 2,900 kilometres—*i.e.*, 5,800 kilometres for the daily return journey—covered 722,000 kilometres in 1932; this distance is thus equivalent to 120 days of the so-called *minimum* service.

The corresponding figures are :

	Days
For Italy, on a system of 19,564 kilometres	120
For Switzerland (and its associates), on a system of 3,400 kilometres	153
For Sweden, on a system of 2,000 kilometres	103
For Poland, on a system of 1,096 kilometres	106
For Denmark, on a system of 1,945 kilometres	63
For Hungary, on a system of 1,230 kilometres	48

On the other hand, Spain actually provided 331 days' minimum service on a system of 920 kilometres ; Greece, 263 days on 740 kilometres. It will be realised that the return of these two undertakings in countries whose economic activity is limited is very praiseworthy ; these good results are no doubt largely due to the permanent nature of the services.

* * *

It is interesting to compare *Graphs* 6 and 7 relating to the Spanish and German undertakings.

The former shows that in Spain, where the same number of kilometres is flown each month (supplementary journeys excluded) all the year round, the utilisation of the services by passengers hardly ever varies more than from 1 to 2. That is a very valuable characteristic of economic working. It affords a marked contrast to the European system as a whole, shown by the dotted line in the same graph ; the average number—calculated per month—of passengers carried by each aeroplane belonging to a regular service varies on this system from 1 to 12 (0.9 to 11).

Graph 7 shows that, in this respect, the German Lufthansa is a typical example of the European system. The distance in kilometres flown rose from approximately 130,000 kilometres in January to 1,130,000 kilometres in August (increase from 1 to 8.5) and fell again to 260,000 kilometres in December (decrease from 8.5 to 2). Similarly, but with a certain difference in the public response to the company's offer, the number of passengers rose from under 1,000 in January to 18,000 in August (variation from 1 to 18) and dropped to 2,200 in December (from 18 to 2.2).

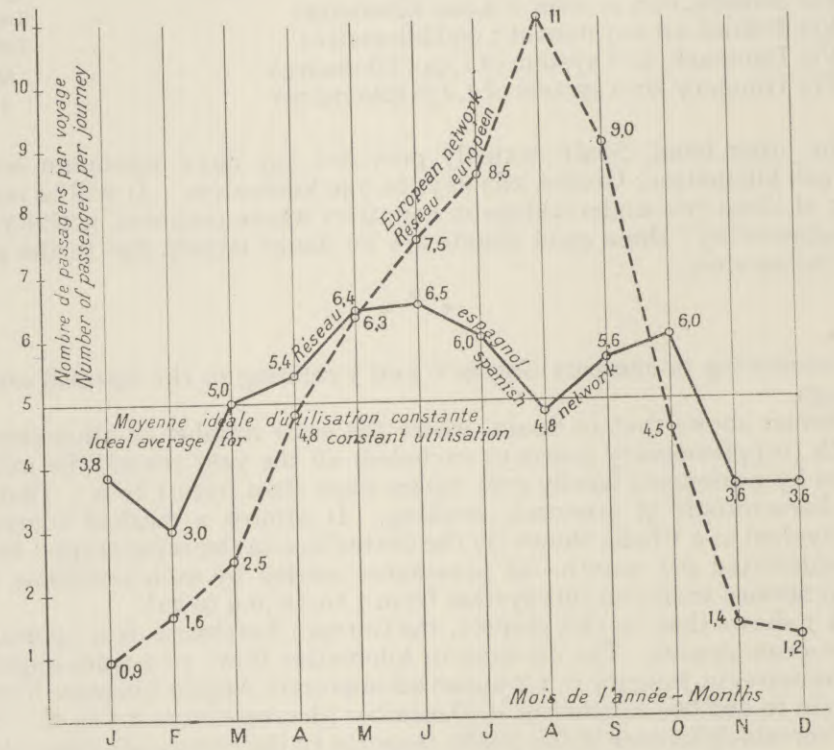
The very considerable variations in the other freights are less easy to calculate. However, I can state that, for the German services as a whole, the goods traffic (in ton-kilometres) rose from 1 (January) to 33 (August), and fell again to 6 (December), while the curve of the postal freight, on another scale, is shown as 1 to 8 to 2.5.

* * *

Lastly, I have drawn up *Table XVII* on the basis of the " Flugpläne " of the Deutsche Lufthansa for 1932. This shows for seven important air-ports of the European system the seasonal variations in the number of arrivals and departures (solely as regards aeroplanes carrying passengers according to the regular time-table).

Graph 6.

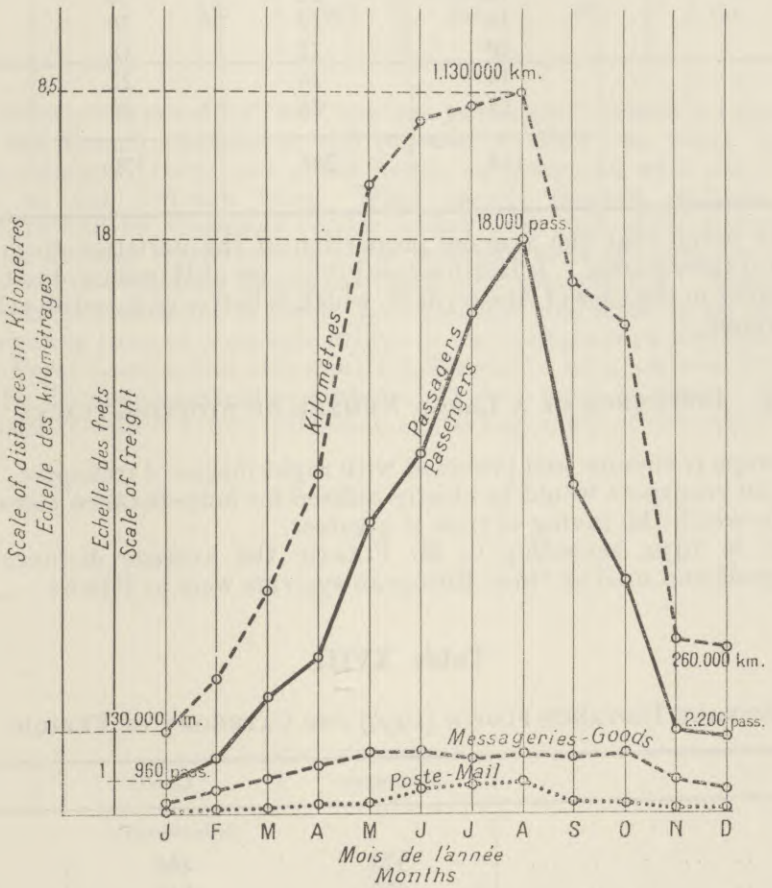
COMPARISON OF THE NUMBER OF PASSENGERS CARRIED PER JOURNEY ON THE SPANISH NETWORK AND ON THE EUROPEAN NETWORK AS A WHOLE (according to the *Revista de Aeronautica*).



Variation from 3 to 6.5 for the Spanish network, operated the year round ; from 0.9 to 11 for the European network, operation only seasonal.

Graph 7.

SEASONAL VARIATION IN THE DISTANCES FLOWN IN KILOMETRES AND THE QUANTITIES OF FREIGHT CARRIED, PER CATEGORY, ON THE *Deutsche Lufthansa* NETWORK IN 1932.



Variation, from January to August, from 1 to 8.5 in the quantity of kilometres flown during the month ; from 1 to 18 in the number of passengers carried.

Table XVII.

SEASONAL VARIATION IN THE NUMBER OF DAILY SERVICES (ARRIVALS AND DEPARTURES).

Arrivals at Departures from	Spring (1/III-30/IV)	Summer (1/V-31/VIII)	Autumn (1/IX-31/X)	Winter (1/XI-28/II)
Berlin	16	42	34	14
Cologne	18	40	38	20
Hamburg	16	22	20	2
Copenhagen	16	28	20	4
Amsterdam	20	22	18	14
Prague	14	26	22	10
Vienna	14	26	20	8
	114	206	172	72

It will be noted that the average proportion of the variation from summer to winter is almost three to one. It is still larger in the case of Hamburg and Copenhagen, but much smaller in the case of Amsterdam, which is better situated in relation to the permanent system.[1]

9. INFLUENCE OF A LARGE NUMBER OF STOPPING-PLACES.

Since Europe is already well provided with rapid means of transport, it might be thought that air transport would be chiefly utilised for long-distance communications —*i.e.*, those in which the saving of time is greatest.

However, in 1930, according to M. PIRATH, the average distances flown by passengers, goods and mail on three European systems were as follows :

Table XVIII.

AVERAGE DISTANCE FLOWN (1930) PER CATEGORY OF FREIGHT.

	Passengers	Goods	Mail
	(Kilometres)		
ITALY	328	440	353
SWEDEN	470	548	620
NETHERLANDS	420	256	377

I have calculated the same values for 1930 and 1932, but in such a way as to reveal the tendency of the German and French enterprises in Europe. The result is shown in *Table XIX*.

[1] In 1933, an initial effort was made to deal with the problem of the excessively seasonal character of the traffic.

Table XIX.

COMPARISON OF THE AVERAGE DISTANCES FLOWN (IN 1930 AND 1932) BY CATEGORY OF FREIGHT.

	Passengers		Goods		Mail	
	1930	1932	1930	1932	1930	1932
	(Kilometres)					
GERMANY	267	284	382	448	387	448
FRANCE	537	565	560	493	1,110	1,180

Thus, the distance covered by the " average passenger ", which is twice as great in the case of the French companies, still represents—after two years' interval—a journey of approximately three and a half hours, as compared with one and three-quarter hours for the German lines. What service (except, perhaps, between London and Paris) can air transport render to-day over such short distances ?

The German average distances for goods and mail, although they are tending to increase, still remain—especially as regards mail—surprisingly low. Altogether, we have a system which, if account is taken of its seasonal character, is far more in the nature of propaganda than of economic utility or the fulfilment of permanent needs. Apart from the Paris-London line, this remark holds good—with a few modifications—in the case of the European system as a whole. It does much to explain the average financial weakness to which I drew attention at the beginning of this report.

CHAPTER IV.

MEANS OF ACTION ON THE BASIS OF THESE RESULTS.

Such are the results achieved up to the end of 1932. It is generally felt that, save for one or two specially favoured cases, considerable progress is necessary, and your Sub-Committee, while confining itself to the technical field, has already pointed out to the Air Transport Co-operation Committee some of the steps which, in its opinion, might be taken. I shall return to them shortly.

Instead of this cautious and analytical treatment of the question, radical measures of re-organisation, either technical or economic, have sometimes been suggested, and others also are conceivable. I think it desirable first to deal with these proposals, if only to show the objections to them, which arise not always on grounds of logic or on account of the nature of things, but in view of the present *de facto* situation of air transport in Europe.

1. Review of the Radical Remedies suggested.

It has been said that it would be sufficient to reduce by half the total amount of subsidies, and the air-transport system would automatically adapt itself to working with reduced resources, and thus the general position would be less remote from sound economy. This happy result might come about if we had at the outset to deal with an air-transport system which, though carrying little traffic and far from financially autonomous, was the outcome of purely economic considerations. We know too well that such is not the case. Are we, then, to apply the same arbitrary coefficient for the reduction of subsidies to systems the nature and immediate prospects of which are as dissimilar as those of the modest British airways of North-Western Europe, the Italian airways in the Mediterranean or the Polish air-transport system ? In other words, are we to destroy some of them and relatively strengthen the others, when hitherto there has been no question of making distinctions between their respective justifiability ? Previous internationalisation would be a *sine qua non* of such a system.

* * *

Others have said that the essential is to ensure that the real price of the services rendered is paid. First of all, that is a principle from which all public economic policy—particularly in the case of transport—has been departing to a remarkable extent for the past half century ; and in that respect air transport has done nothing new. Then, again, how are we to define the price of the service rendered ? Is it to be the same as the price of the service offered—that is to say, the actual cost ? Is not the real problem primarily that the public should attach a certain value to the services which air transport claims to give them ? True, there are certain lines where, in the absence of agreements for joint management, full advantage has not yet been taken of the public favour that has been won ; but perhaps there is really only one line among all the European systems which would allow of such an adjustment. Furthermore, when certain coefficients of economic utilisation amount to 10 per cent and the coefficients of financial independence to 2 per cent, what would a sharp rise in tariffs mean but a desire to " fill the vacuum " ?

* * *

One might as well propose a purely arithmetical principle of organisation, reasoning as follows :

There is available for air transport in Europe an air fleet the total effective tonnage of which represents 500 tons of pay-load. In 1932, these aeroplanes and seaplanes offered the public 27 million t.-km., of which the public used about 12½ millions, which would correspond to, at most, 10 million t.-km. paid for at the full rate. Now, an air fleet of 500 tons, flying four hours a day at 170 km. an hour, produces 340,000 t.-km. daily—that is to say, 124 million t.-km. per year. If we accept the present utilisation coefficient of 46 per cent, there would be 60 million t.-km. instead of the present 12.5—that is to say, the quantity of transport actually effected in Europe might be carried with less than a quarter of the air fleet, still using it only to the extent of 46 per cent.

Our only technical hypothesis was that aircraft flew four hours a day—that is to say, 1,460 hours a year. This figure is already regularly exceeded in the United States (where certain air lines are organised on the basis of eight hours per aircraft per day for 1934), and, in Europe, one or two companies reach it with their best aircraft.

Implicitly, however, we have made a much bolder geographical and economic hypothesis : we have allowed for redistribution of means of transport—that is to say, of the national air-transport fleets—in time and space, in order that the air fleet as finally selected and organised may be more speedily utilised. We thus have a new air-transport system—in fact, the " rationalised " air-transport system which we have not yet been able to define.

Who, then, under present air-transport conditions, would be prepared to sacrifice lines the poor results of which do not even prove that they are of no value ? A new aircraft and a new time-table might be sufficient to increase tenfold the value of an air connection which at present seems to be merely a useless burden on the air line.

Above all, what country, in the present state of Europe, would *simultaneously* agree to do away with such lines and to continue the national subsidies granted to those lines for the benefit of a " general pool ", the distribution of which would not necessarily give it an equivalent compensation in respect of its national interest ?

* * *

I have thus been able to note certain striking inequalities as between the " activities " or the " financial autonomies " of the various lines, but I have not found a general criterion for comparison.

Nevertheless, at the end of *Chapter III*, two features connected with management have been shown to have an unquestionable influence—on the one hand, the seasonal character of transport, and, on the other, the numerous landings that account for the very short length of the average flights which air transport is called on to carry out in Europe.

Would it, then, be sufficient :

(1) To lay down that services should be permanent ?

(2) To complete the " omnibus " transport system by " express " services making non-stop flights between important terminal points ?

This would certainly mean that the present subsidies would have to be at least doubled. Similarly, the traffic results would be extremely uncertain and the risk of counter-propaganda would be very great, since Europe is not equipped for such traffic.

2. Influence of Natural Evolution.

Must we, then, simply fall back on a policy of *laisser-faire* and trust to time and experience to incite to selection and bring about progress ? Some of the most highly

qualified of those who are doing responsible work in this field think so, and they are very ready to bring forward as an argument in favour of their theory the improvement which took place in 1933 in the results of air transport in Europe.

This general improvement cannot be denied. I regret that I have not already final figures on this point and that I cannot wait for them.[1]

Yet, I should not be surprised if the increase of traffic over 1932 in ton-kilometres carried reached 25 per cent.[2] The coefficient of utilisation should be slightly more than 50 per cent instead of 46 per cent last year, since the putting into service of larger aircraft has counteracted the effects of the increase in traffic.

These are important results. I do not think, however, that, for Europe as a whole, the financial results of operation have appreciably increased. Greater immobilisation as a result of renewal of air fleets, the obligation to redeem capital more rapidly, and reduced rates have counterbalanced most of the progress in traffic. Above all, I doubt whether this progress can be developed or even maintained if the operation agreements, which were first intended to limit the effects of competition, do not bind the operating countries in a more general and more effective manner.

What is the origin of this increase in traffic ? Education of the public, demonstration of greater security ; but, above all, the putting into service of speedier and more comfortable aircraft, giving cheaper service with improved time-tables.

In this matter of technical improvement and lowering of tariffs, it will often be found that it is *impossible in practice* to do anything unless the freight offered for air transport increases *considerably*.

Can such freight increase much in Europe, Europe which we are often told is *too small and too well provided with speedy surface transport* for air transport to establish itself by reason of its speed ?

But is that true ? Has Europe already speedy means of transport ?

Such was the first statement to be verified, the first positive fact to be ascertained. No doubt certain specialists have this information. Nevertheless, it was difficult to obtain, even approximately, though working with the assistance of specialists ; and I think it desirable to give here the results of that examination.

3. Examination of Traffic Speed in Europe.

In a letter dated April 5th, 1933, I asked the Communications and Transit Section of the League of Nations to be so good as officially to consult the International Sleeping-Car Company on the real situation as regards fast communications in Europe served by surface traffic. I wrote :

> " I should like to know the minimum time taken by travel (distinguishing between hours by day and hours by night) between the following towns :
>
> " London, Paris, Amsterdam, Brussels, Antwerp, Cologne, Hanover, Hamburg, Copenhagen, Malmö, Stockholm, Oslo, Helsinki, Tallinn, Leningrad, Strasburg, Frankfort-on-Main, Nuremberg, Leipzig, Prague, Berlin, Danzig, Königsberg, Kaunas, Riga, Moscow, Warsaw, Cracow, Lwow, Kiew, Odessa, Cernauti, Bucharest, Istanbul, Vienna, Budapest, Belgrade, Sofia, Salonica, Athens, Ankara, Smyrna, Beirut, Cairo, Munich, Basle,

---

[1] *In November* 1933, I received certain official results for 1932, and, by the end of December 1933, Germany had not yet indicated the results *per line* for her traffic in 1932.

[2] As will be seen from *Table XXI*, this estimate has been checked in order to ascertain the final position : actually, there has been an increase of 22%, and the coefficient of utilisation seems in fact to be very near 50%.

Zurich, Geneva, Milan, Venice, Rome, Brindisi, Tunis, Tripoli, Lyons, Marseilles, Toulouse, Bordeaux, Barcelona, Madrid, Seville, Lisbon, Tangier, Casablanca, Oran, Algiers, Benghazi.

" Account should then be taken of seasonal variations in time-tables so as to show specially whether the services exist all the year or not.

" I would take as a general hypothesis that the traveller is ready to pay the maximum price and to be supplied with maximum comfort and convenience; in particular, travelling as often as possible by night and as seldom as possible by day, since we have in mind, above all, the traveller in a hurry (business-man) whose office hours are *a priori* the most valuable."

The question of permanency and seasonal variation of the communications in question was essential, and, indeed, characteristics of frequency as well, *for we are not always dealing with daily services.* Nevertheless, I quite understand the magnitude of the work asked for, and I was not surprised that the International Sleeping-Car Company was not able in its reply to take into account questions connected with permanency and seasonal variations. The information I have received is already very full and the International Sleeping-Car Company is entitled to all our gratitude.

The members of the Sub-Committee will realise this, since I have been able, as an *annex*, to reproduce four tables which show in the case of sixty-seven European and Mediterranean towns, taken two by two, the time for travel required by the best surface means of transport.

This work is directly connected with that of the Sub-Committee, the towns in respect of which information is required being the same as those which appear on the map entitled " Main network ", which was examined at your previous session.

Sheet I shows 1,156 connections ; Sheet II and Sheet III each show 1,122 ; Sheet IV, 1,089. This makes a total of 4,489 connections, which should be shown alongside the time of flight in hours and quarters of an hour, showing (in figures in *italic*) the *number of nights* occupied by the journey. In practice, such time-periods are expressly shown only in the case of about 3,000 connections. In most of the other 1,500 cases, the desired time-period is obtained by adding together the two time-periods shown in the tables.

4. Aeronautical Significance of Surface Speeds.

In *Table XX* below, I have classified about thirty characteristic air-transport connections in the decreasing order of their speed, as reckoned for commercial purposes. This *table* shows that, if we take international connections over distances equal to 700 km. or more, *only one of them, Paris-Berlin, provides transport at a speed exceeding 60 km. per hour.* I am not sure that there is more than one exceeding 50 km. per hour ; several (perhaps five or six) enable a speed of 40-50 km. per hour to be maintained over a distance of 700-1,050 km. For distances between 1,100 and 2,000 km. the speed falls to 30-40 km. The greater part of the connections shown in the " main network " of your Sub-Committee show speeds of 26, 21, 17 and even 13 km. an hour.

If, therefore, we take a network of through air communications between those terminal points providing a commercial speed of 225 km. per hour, which has to-day been technically achieved, it is possible by air to save the theoretical time-periods shown in the last column of *Table XX*. These are some of them : a saving of 9 hours 15 mins. on the route Paris-Berlin (820 km.), of 19 hours 23 mins. Amsterdam-Copenhagen (700 km.), of 36 hours 40 mins. Lwow-Sofia (750 km.), of 60 hours 13 mins. Oslo-Leningrad (1,000 km.), of 126 hours 13 mins. Moscow-Ankara (1,750 km.).

Table XX.

Present Speed of Surface Transport and Possible Saving of Time by Rapid Air Transport.

Les temps de ce tableau sont ceux qui ont été indiqués par la Compagnie internationale des Wagons-Lits et qui figurent aux tableaux A, B, C et D annexés à ce rapport.

The duration of time of this table is that indicated by the International Sleeping-Car Company, and which figures in Tables A, B, C and D annexed to this report.

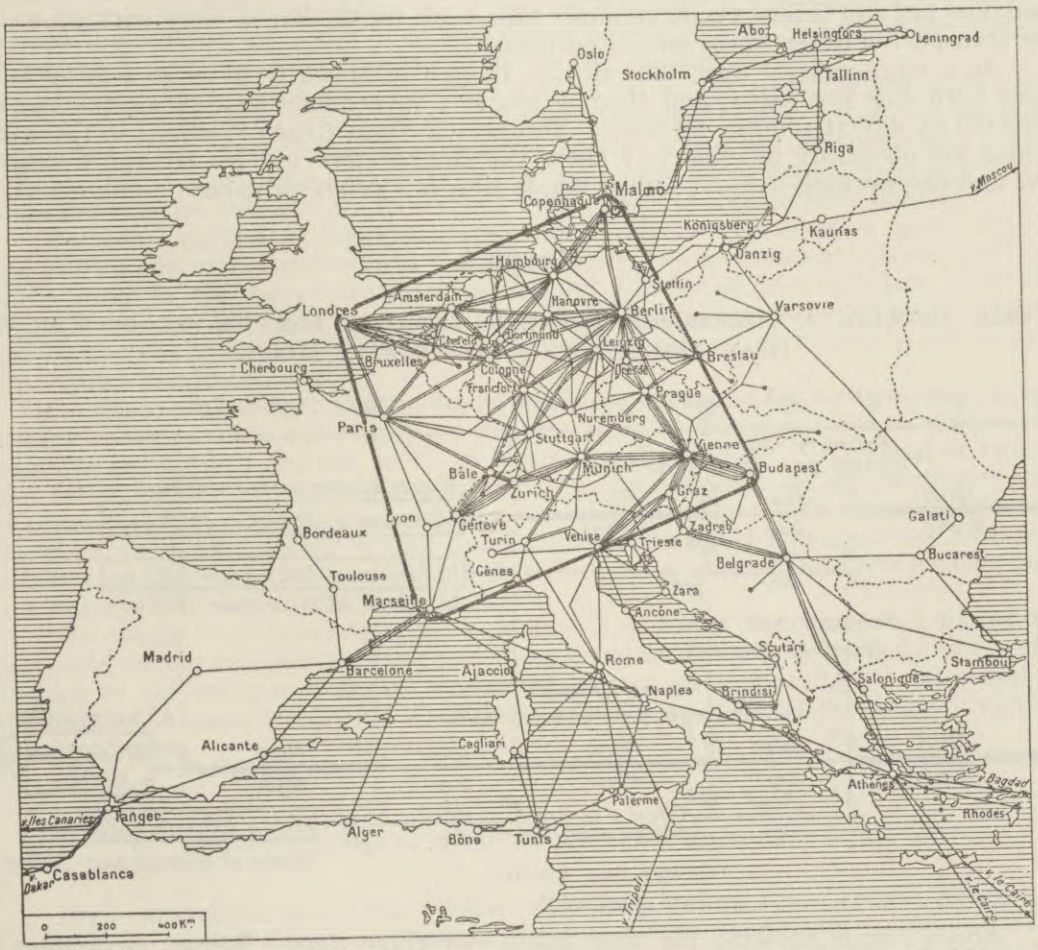
	Parcours / Journey	Liaisons actuelles par moyens de surface / Present connection by surface means of transport			Liaison aérienne techniquement possible / Air connection technically possible	Gain théorique possible, grâce à l'avion à 225 km.-h. / Gain theoretically possible by aircraft at 225 km.-h.
		Distance en ligne droite / Distance in a straight line	Temps / Time	Vitesse commerciale / Commercial speed	Temps (à 225 km.-h.) / Time (at 225 km.-h.)	
		Km.		Km.-h.		
A 60 km.-h. / At 60 km.-h.	PARIS–BERLIN	820	13 h. 15	62	4 h.	9 h. 15
A 50 km.-h. / At 50 km.-h.	PARIS–ROME	1.125	22 h. 30	50	5 h.	17 h. 30
De 40 à 50 km.-h. / From 40 to 50 km.-h.	HAMBOURG–ZURICH / HAMBURG	700	16 h.	43	3 h. 07	12 h. 53
	PARIS–COPENHAGUE / COPENHAGEN	1.050	25 h.	42	4 h. 40	20 h. 10
	PRAGUE–BRUXELLES / BRUSSELS	800	19 h. 30	41	3 h. 30	16 h.
	GENÈVE–VIENNE / GEVEVA–VIENNA	800	21 h.	38	3 h. 30	17 h. 30
De 30 à 40 km.-h. / From 30 to 40 km.-h.	COPENHAGUE–GENÈVE / COPENHAGEN–GENEVA	1.150	35 h. 45	32	5 h. 07	30 h. 38
	AMSTERDAM–COPENHAGUE / COPENHAGEN	700	22 h. 30	31	3 h. 07	19 h. 23
	AMSTERDAM–STOCKHOLM	1.150	35 h. 45	32	5 h. 07	30 h. 38
	MADRID–VARSOVIE / WARSAW	2.250	58 h. 15	38	10 h.	48 h. 15
	MADRID–SOFIA	2.300	68 h. 15	33	10 h. 14	58 h. 01
	LONDRES–MOSCOU / LONDON–MOSCOW	2.400	64 h. 15	37	10 h. 42	53 h. 33
	MOSCOU–ROME / MOSCOW	2.250	73 h.	30	10 h.	63 h.
	LONDRES–ISTANBUL / LONDON	2.400	64 h. 30	37	10 h. 42	53 h. 48
	ROME–VARSOVIE / WARSAW	1.250	41 h.	30	5 h. 22	35 h. 38
De 20 à 30 km.-h. / From 20 to 30 km.-h.	ISTANBUL–STOCKHOLM	2.200	83 h.	26	9 h. 42	73 h. 18
	BERLIN–TRIPOLI	2.250	89 h. 30	25	10 h.	79 h. 30
	LISBONNE–TRIPOLI / LISBON	2.200	97 h. (par via Rome)	22	9 h. 42	87 h. 18
	COPENHAGUE–LE CAIRE / COPENHAGEN–CAIRO	3.250	155 h.	21	14 h. 25	140 h. 35
De 10 à 20 km.-h. / From 10 to 20 km.-h.	LWOW–SOFIA	750	40 h.	19	3 h. 20	36 h. 40
	HELSINKI–LE CAIRE / CAIRO	3.400 (par via Stockholm)	191 h.	17	15 h. 07	175 h. 53
	OSLO–LENINGRAD	1.000	64 h. 45	16	4 h. 32	60 h. 13
	BRINDISI–ISTANBUL	950	54 h.	17	4 h. 08	49 h. 52
	ALGER–LE CAIRE / ALGIERS–CAIRO	2.600	106 h.	12	11 h. 33	94 h. 27
	ISTANBUL–TRIPOLI	1.700	132 h. 30	13	7 h. 33	124 h. 57
	MOSCOU–ANKARA / MOSCOW	1.750	134 h.	13	7 h. 47	126 h. 13

First conclusion : *Surface traffic does not provide fast transport in Europe,* or at least its speed bears no relation to that to which the slowest commercial aircraft has already accustomed us.

To return to Table XX, we see that the longest connection shown, Helsinki-Cairo (3,400 km. in a straight line), requires 191 hours—that is to say, eight days and eight nights—if surface transport is used ; it can be reduced to 15 hours 7 mins. by air transport at a commercial speed of 225 km. an hour. In this case, such an estimate of speed is an optimistic one, for account must be taken of the unavoidable landings (or landing), and the need for night-flying over part of the route. But with the exception of these two connections, Helsinki-Cairo and Copenhagen-Cairo, our table shows all the flights that aircraft (at a commercial speed of 225 km. per hour) make within a time-period which is always less than twelve hours.

Second conclusion : *The European area is suitable for fast day-time flying.*

If now we take, not the whole of Europe, but the north-western zone in which the networks with the greatest density of traffic are established (the quadrilateral London-Malmö-Budapest-Marseilles), we see that the greatest distance equivalent to the longest diagonal (see below) is 1,450 km. This is barely 6½ hours' non-stop



AREA IN EUROPE WITH THE MAXIMUM DENSITY OF REGULAR AIR TRAFFIC. (The lines are only approximately correct ; the basic map used showed the network in 1931.)

flight at 225 km. an hour. Paris-Warsaw, London-Warsaw, London-Stockholm, Paris-Belgrade, London-Madrid, London-Rome, Paris-Algiers are flights shorter than the diagonal flight in question.

Third conclusion : *That part of Europe which is economically the most active will soon be one single territorial district which a fast aircraft will cross in half-a-day's day-time flying.*

5. Significance of Very Great Speeds.

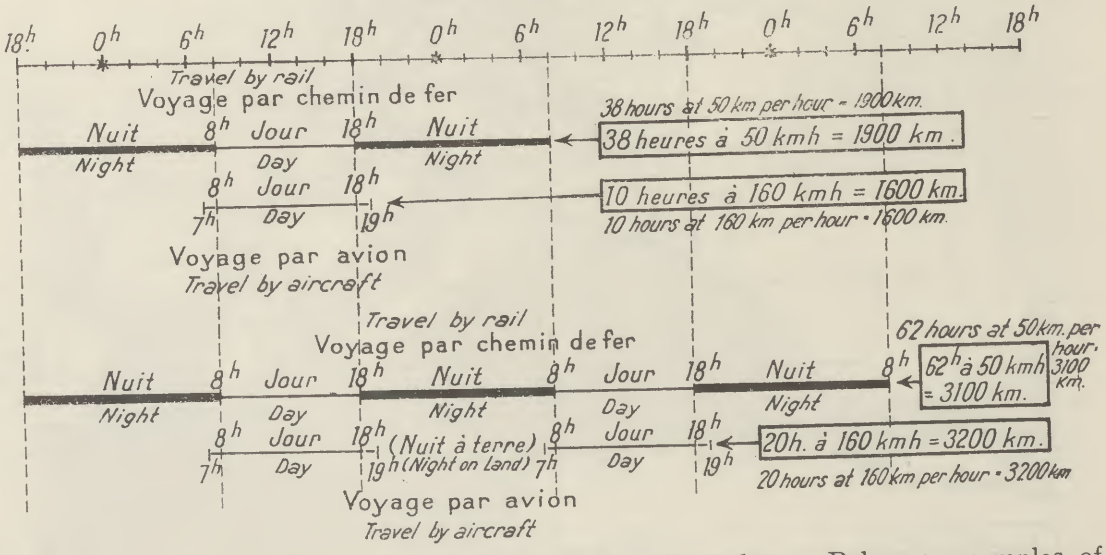
Very great speed is an essential condition to justify the use of aircraft and to cause it to be used in the near future for short and medium distances in Europe. Indeed, it is too often forgotten that the saving in time by air traffic is purely theoretical in the case of the ordinary business man. He prefers to travel during the hours of the night, which are supposed to be unproductive, provided he can rest on the journey and arrive at his destination *ready for business.*

On this hypothesis, Paris-Berlin by railway (a journey of 13 hours 15 mins., including a comfortable night in a sleeping-car and with arrival early in the morning) is infinitely preferable to a journey by air which actually starts at 7.30 in the morning and does not end before 5 p.m. (summer time-table for the line in 1933, with allowance for transport between towns and aerodromes).

In a more general way, the railway, though its speed is 50 or 40 km. an hour, runs both day and night, and thereby places a severe handicap on air transport if effected by day at 160 km. an hour. This is clear from *Graph* 8, where, in two cases, which are obviously imaginary, I show the comparative use by air and by rail of *one* and *two* working-days by a man whose time is *a priori* valuable.

Graph 8.

Table showing a Comparison between the Use for Travel of Railway (Day and Night) and Aircraft (Day).



Above : scale showing the time taken, for three days. Below : examples of use of means of transport for one or two working-days occupied in travel.

This comparison presupposes that the aircraft flies ten hours a day, which, even in summer, obliges the traveller to begin his day very early. Moreover, the ten hours of flight are necessarily interrupted by from one to three landings, with which even the average 1933 aircraft will have difficulty in keeping up for a distance of 1,600 km. the *commercial* speed of 160 km. an hour between the terminal points. It will be seen that, even if we accept this optimistic hypothesis, the railway, at 50 km. an hour, enables 1,900 km., or 300 km. more than the aircraft, to be travelled as a counter-balance to the working-day sacrificed. Furthermore, the hours during the day in a *train de luxe* are much more suitable for work or for resting the mind.

Having sacrificed two working-days, the passenger in the *train de luxe* covers (in two days and three nights) 3,100 km. at 50 km. an hour. This time, the aircraft will have caught him up ; but, in order to rest from twenty hours in *a slow* aircraft in two days, the night on land on arrival will not have been any too much.

At 225 km. an hour effective commercial speed, the aircraft, in ten hours' daylight flying, easily beats the train, which travels for one day and two nights at 50 km. an hour (2,250 km. as against 1,900). In two days, the aircraft will beat the train by 1,400 km., without any need for night-flying.

The position of the fast aircraft is much more favourable still over long distances, since *there is no surface transport of* 50 *km. an hour over a distance of* 4,500 *km.* ; in Europe, over 2,000 km., and even sometimes over 1,000 km., the average speed is 35 km. an hour ; over 3,000 km. it falls to 20 km. an hour or less.

It might, then, be thought that the gain of 50 to 175 hours, which is obtained by aircraft, exceeds the minimum required for attracting traffic. I do not think so ; in practice, these connections are very often those in which the need for speed has not yet been felt, and a much greater saving of time must be offered if passengers—and those not very numerous—are to think it worth while to change their habits.

Further, I agree that the advantage of great effective commercial speed (225 km. and over) is still more conclusive in the case of short- and medium-distance connections, particularly in the heavy traffic quadrilateral London-Malmö-Budapest-Marseilles. *There, the desire for speed already exists and is inadequately met* both by the railway and by the daylight aircraft flying at 150-160 km. an hour, according to the seasonal time-tables mentioned above.

On the other hand, at 225 km. an hour a large system of *through* connections may attract passengers who are ready to pay the fares of the main express sleeping-car trains to cover 700-1,200 km. in 16-36 hours (see Table XX). If instead of twenty-four hours' surface travel, from 8 p.m. to 8 p.m., for instance, we substitute five hours of comfortable daylight flying, we offer the special public which uses this means of travel an undoubted saving in time and fatigue, particularly if the journey both ways is taken into account and if we assume that the normal passenger prefers his own home to a hotel and a hotel to a railway berth.

We should have more tangible evidence if we took the number of high-priced seats sold during the year between two given terminal points. We should thus obtain an idea of the volume of traffic now being carried at *high* transport rates and the connections in respect of which air services would have the best prospects of securing speedy returns.

6. High Speeds and Ground Organisation for Aviation.

High commercial speed has another advantage ; it enables daylight flying to be regarded as normal flying in Western Europe—at all events, for passenger traffic. It is thus possible to continue to concentrate work in respect of light signals on those

lines where the North-European experiment in fast mail services is being carried out. This does not mean that there is no need to improve ground organisation elsewhere. On the contrary, the preliminary condition for the general spread of fast air transport in Europe is a homogeneous and widespread ground organisation, a term which does not very well express the system of connections (warnings, wireless transmissions, guidance by Hertzian waves, etc.) which I have in mind. Light signals are only one special method used in that system, and their relative importance is decreasing; in the same way *night-flying* is only a special case of *all-weather flying*, which is a necessary condition for *permanent* air services that the public would accept as normal. What we must set up are well-equipped airports, placed—unless there is a technical need for a landing-place—only at points where the traffic to be expected from the neighbouring town justifies their establishment. Between all these possible terminal points—and there are as many of them as there are destinations—meteorological protection and wireless information or guidance services must guarantee the safety of aircraft suitable for use in such permanent traffic. Thus the idea of a *protected zone* takes the place of an *equipped line*, at all events in the European zone of heavy commercial traffic. Within such a zone, all direct connections must become equally possible.

A similar "zone protection" system has been studied by M. Petzel, one of Professor Pirath's collaborators in preparing the latest publication of the Stuttgart Institute,[1] which considers the following concrete case : Zone 300 km. in diameter, with central airport, crossed by two routes with day- and night-flying and a frequency of 1-8 aircraft per hour. The cost *per hour* of protection of flight *(Flugsicherung)* varies from 101.47 RM. (for 4 hours' working a day) to 45.45 RM. (for 24 hours). To this must be *added, per hour of night traffic*, 77.24 RM. (if there are 4 hours' traffic), 43.01 RM. (if there are 12 hours' traffic) and 38.74 RM. (if there are 16 hours' night traffic). Thus 24 hours' protective measures, 12 of them by night, will cost 1,607 RM. daily, or 586,555 RM.—that is, about 3,578,000 francs—a year.

Another of Professor Pirath's collaborators, M. Rössger, examines the case of the American line Richmond-Atlanta (758 km.) and estimates the cost of protection of flight over that *line* at 869,500 RM. yearly. The details of expenditure are as follows :

	RM.
Light signals	268,000
Five emergency aerodromes	59,200
Regional meteorological information service	30,800
Aerodrome meteorological information service	126,500
Wireless and wireless beacons	192,500
Messages by teletypewriter	174,500
	869,500

This amounts to about 5,200,000 francs, or 6,880 francs per km. of line, exclusive, of course, of cost of initial establishment.

I received from the competent American administration, three years ago, the following information with regard to the expenditure in question and cost of operation (1930 dollars, reckoned at 25 francs per dollar) :

1. Cost of establishing an air route equipped with suitable beacons and light signals for night traffic : $370 per mile.

[1] "Forschungsergebnisse des verkehrswissenschaftlichen Instituts für Luftfahrt"; No. 6 : "Die Grund lagen der Flugsicherung."

2. Cost of maintenance of civil-aviation route, including hire of land and preparation of such land for emergency landing-places *(intermediate field)* : $210 per mile and per year.

3. Annual hire of automatic " teletypewriter " telegraph service : $70 per mile.

4. Establishment of a wireless beacon : $12,000.

5. Maintenance of wireless beacon : $6,000 per year.

6. Establishment of a wireless station for meteorological and urgent messages to aircraft : $24,000.

7. Maintenance of wireless station : $14,000 per year.

This somewhat heterogeneous information will at least give us a possibility of comparison with the more definitely established prices which everyone will know in such particular cases.

At all events it will be clear that, if, in Europe, we are to have a proper " protective equipment " for air transport (that is to say, an equipment making it possible to have permanent services at an effective commercial speed of 225 km.), a more substantial proportion of the public credits granted to commercial aviation will have to be used for the purpose ; perhaps 25 per cent instead of 10-15 per cent.

Lastly, it may be questioned whether the mountains and seas and climate of the Europe-Mediterranean area will not place more serious obstacles in the way of developments in this direction than that which it meets in the United States.

It would not appear that we have to fear that, if we turn to the following analysis made by M. Petzel. In the summer of 1931, the network of air communications included :

(a) 11 per cent flight over the sea ;
(b) 35 per cent flight in flat country ;
(c) 3 per cent flight coastal and flat country ;
(d) 28 per cent flight flat and fairly mountainous country ;
(e) 3 per cent flight fairly mountainous country ;
(f) 14 per cent flight various, including high mountains ;
(g) 6 per cent flight high and fairly high mountains.

Thus, if we set aside the last two categories, 80 per cent of the routes over which aircraft fly would appear to be suitable for the establishment of " flight protection ". Naturally, we may say that if certain lines which would have been very useful have not been established, it is simply because the route would have been too difficult to equip and protect. Nevertheless, the most active part of Europe economically includes, besides the southern part of the United Kingdom, the great north-western plain stretching from Poland to France.

The system of zone protection, even more than that of the " equipped route ", requires that " technical unity of equipment " which the Air Transport Co-operation Committee recommended during its last session. On that account, we should welcome and study the idea put forward by your late colleague M. Chaumié, of " International Ground Equipment Companies ", meaning by that term the general safety equipment connected with the ground. Such companies would guarantee, better than any other system, technical uniformity, uniformity in methods and even in instructions ; and such uniformity is particularly necessary in the cases—which in the near future will be very frequent—of " radioguided " aircraft approaching the ground and even landing, when the crew, which is solely responsible for manœuvring them, should be able almost by instinct to use the approaches placed at its disposal. Should not certain precautions be taken in view of the twenty or twenty-five languages spoken in Europe ?

With a view to meeting the suggestions of your Committee, the " International Ground Equipment Companies " might first be set up by means of periodical International Air Conferences and within the territorial area for which such Conferences are competent.

7. Main Network of Permanent Air Routes.

Referring here to the actual words in which one of the tasks of your Sub-Committee was defined two years ago, I should like to point out the inconsistency between these terms and those I have just used: " protected zones ", " direct connections ", etc.

Furthermore, our Committee, examining the map of the " essential connections " which was carefully prepared by the Sub-Committee, had already recommended its revision. In its end-of-session report it asked the Sub-Committee to continue its work "on the basis of this map ", but added immediately :

> " This *scheme* in no way affects conditions and modes of operation ; the latter may be influenced by technical progress and by the desire to connect distant points without intermediate stopping-places."

It is this possibility which is being achieved now. The progress in aviation, the need for longer direct connections, the disfavour felt for continuous light signals confining aircraft to one route—everything is tending to reduce the usefulness of a suggested network which is already inadequate. Commercial aviation to-day is proposing much more than was asked of it two years ago ; it is suggesting very fast direct connections between all important destinations. A continuous itinerary from town to town can only facilitate and assist operation if the succession of landings procures traffic that more than compensates for the outlay involved.

A specialist in " air work ", M. Henri Balleyguier, Managing Director of the *Compagnie Aérienne Française*, three years ago criticised contractual commercial aviation as suffering from " rail psychosis ". There was much truth in that assertion ; but technical progress and the economic difficulties encountered as a result of hidebound management have already done much to cure that psychosis and, above all, to make us aware of the fact. Aviation ought to be freer than is as yet realised. It is this freedom that will give it its permanent strength ; at all events if we can construct a framework suitable for its operation.

8. Aircraft for Fast Air Transport.

Throughout Europe, commercial air-transport fleets are in full process of renewal. Undoubtedly, in this matter, most national technical experts have followed developments in America, and, indeed, certain exhibition flights—particularly those of " Swissair "—which have been carried out with American aircraft have done much to spread the conception of very high speeds.

It is therefore of particular interest to recall briefly how, during the last five years, public air-transport aircraft have developed in the United States over a network of airways allowing or necessitating landings every 400-500 km. :

> *Average* 1929 *aircraft :* Single 450 h.p. engine carrying 400-450 kg. of " pay-load " at a cruising speed of 160 km. an hour.
>
> *Average* 1932 *aircraft :* Triple 900-1,400 h.p. engine carrying a " pay-load " of 1,000 kg. at a cruising speed of 160-185 km. an hour.

1933 *aircraft :* The triple engine of 1,000-1,600 h.p. carrying 800 kg. " pay-load " at a cruising speed of 200-220 km. an hour takes a prominent place. But at the same time the attempt to obtain cruising speeds of 240, 260 and even 290 km. an hour is having the effect of " refining " single-engined aircraft of the *Lockheed " Orion "* or *Northrop* type, and has, in particular, led to the construction of a new class of 1,400 h.p. twin-engined aircraft which, while more " refined " and faster, are also more comfortable than triple-engined aircraft of the same power.

Advocates of triple engines are also pressing forward, so that the year 1934 will doubtless see existing simultaneously in the United States mixed public transport aircraft (mails—to keep the vital benefit of their contracts—parcel post and, above all, passengers) with single, twin or triple engines, carrying loads of 500-1,000 kg. at cruising speeds of 200-280 km. an hour.

In Europe, the improvement in the performance of *Junkers Ju* 52-3 m., the appearance of the new *Dewoitine* and *Fokker* machines, and certain decisions like that of the *Deutsche Lufthansa,* which is basing its 1934 time-tables on an average travelling speed of 220 km. an hour instead of 160 km., all means the coming of fast aviation. It seems certain, however, that Europe will abandon the fast single-engined aircraft even sooner than the United States—since it does not adequately satisfy *the sense* of safety—and that Europe will be almost exclusively equipped for several years with triple-engined machines with the following characteristics : total engine-power 1,200-2,000 h.p. ; load 1,000-1,600 kg. (8-15 passengers) according to the length of direct flights, at a cruising speed of 240-270 km. an hour (time-table speed : 210-240 km. an hour).

This aircraft will supersede those which in 1932 were still carrying an average pay-load of 825 kg. with an engine-power of 630 h.p., and, in 1933, 805 kg. with 660 h.p. For 1934, therefore, there is a sharp increase in engine-power in proportion to the commercial load. At the same time, the load per square metre of carrying surface rises from 75 to 100 kg. ; the load per horse-power falls from 8 to 5 kg. ; the percentage of total weight representing the pay-load falls from 19 per cent to 12 per cent ; the maximum speed rises from 230 to 310 km. per hour and the landing speed from 80 to 100 km. per hour.

It will be noted that the margin between the extreme speeds (100 to 310 against 80 to 230 km. an hour) would thus seem to increase by 60 km. an hour (210 against 150) —that is to say, by a figure equivalent to three-quarters of the increase shown in maximum speeds (80 km. an hour). This is evidence of a very remarkable technical advance, which, however, will have to be pursued energetically. Indeed, it is a question whether the actual service will show these differences in speed and also if, once the differences are verified, they will not be insufficient in practice. Personally, I think that—so long as the hypothesis of emergency landings is not excluded—a minimum speed of 100 km. an hour is still too high ; and that, in my opinion, is sufficient to condemn the use in Europe of a very fast single engine and perhaps of twin engines, since, should one engine stop, the remaining unit will often have to work at full pressure, even though assisted by a variable pitch propeller. I prefer triple engines, if speed and safety alone are to be considered ; or the quadruple-engined aircraft with units grouped laterally or in line along the carrying surface, if much consideration is to be shown for the comfort of passengers, particularly on long flights.

9. Technical Consequences of the Use of the New Fast Aircraft.

I am, however, of opinion that, within two years, the stock of aircraft of the European companies will have been renewed. On the assumption that the principles of management remain the same as to-day, 300-400 machines of 1,200-1,500 h.p.

will replace 650 machines of 660 h.p. This would be a very heavy burden, first by reason of the capital which would have to be sunk (400-500 million francs) and secondly by reason of the difficulty of keeping this aircraft fleet, the payment for which has not yet begun, up to the level of technical progress—which is developing so rapidly. It would therefore be most desirable that the various companies should not be compelled to adopt the new " uniform " technical system and that competition should enable a number of them to choose, without external pressure, the material which is most suitable for their operation and the area in which they will chiefly work. For, though I think that a speed of 225 km. an hour is necessary, I also think that it may be attained by multiple engines of average power (three engines of 150-200 h.p.).

Above all, we must not forget that, at the present stage of technical progress, high speed necessarily involves the maintenance of subsidies. It has been shown to-day that, if the needless rivalry between contracting companies were no longer fostered, it would be possible to organise a certain number of regular air services across Europe, without subsidy, at a speed of 160 km. per hour.[1] But, firstly, I am of opinion that these services would justify themselves only over very few routes, and, secondly, a speed of 160 km. an hour is not a deciding factor either in itself or mainly on account of the extra services it involves in respect of variations in weather conditions. Lastly, as there is no prospect in present circumstances in Europe of abolishing subsidies by general consent, *the first problem is to make the best use of such subsidies in a manner enabling air transport to establish itself once and for all.*

We must therefore always be ready to take advantage of *future* technical progress, and for that reason the mass renewal of air fleets—made necessary by competition—may constitute an unfortunate hindrance. Borrowed capital spent on material is already being currently repaid at annual rates of 20-25 per cent ; some of the main European companies paid off capital borrowings to the extent of 30-35 per cent during the financial year 1932. How could that be possible for any considerable time without a real or concealed increase in subsidies, so long as the seasonal traffic and overlapping or duplication as between national concerns prevent an intensive annual re-allocation? Can we expect to go on for a long time with a system which involves 200 hours per annum for four years, and then 500 hours for two years, using excessively large air fleets which we shall have to renew as soon as competition makes such renewal necessary ? With an increase in the price per unit, which is the inevitable consequence of increased speed, no economically sound system of renewal will be possible until we can *deal with large numbers*. The first result of the renewals at present being carried out will, no doubt, in the case of each national operating company, be a reduction in the number of aircraft in use. Thus we should go further than a " pool " of receipts and tend in the direction of a " pool " of aircraft—that is to say, an air fleet, based on the smallest possible number of models and technical characteristics, common to a number of national operating companies *bound together* by ties of competition.

Nevertheless, it will be difficult to develop the re-allocation of aircraft speedily enough to prevent the longevity of aircraft being an obstacle to technical progress. We are thus led to determine or to establish, which will necessitate reciprocity agreements, secondary " operation areas "—that is to say, zones or lines in which there would be used aircraft, still in excellent condition but technically out of date, which, in two or three years, would have flown *only* 3,000 or 4,000 hours on the busiest European air lines. For we have already begun to count in thousands of hours.

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[1] In 1933, this experiment was carried out by the " Dragon " de Havilland twin-engined aeroplanes and the " Cruiser " Spartan triple-engined aeroplanes. Accommodation was provided at 0.35-0.45 franc per km.

10. Consequences of Operation.

It is not within my competence to draw up a traffic programme of a more or less co-operative character. I will rather refer to the recommendations made by the Air Transport Co-operation Committee at its last session, which were inserted in the final Report under the title : " *Operation of a Main Network.*"

The Committee recommended :

" 1. Special treatment for postal services to the extent required by the exigencies of this type of freight."

It would, I think, be very interesting to know the results obtained at the end of the 1933 season by the postal experiment made in Northern Europe. I would only point out for the moment that this seasonal operation has not yet led to the building of aircraft exclusively intended for postal work and having a capacity proportionate to the quantity of freight carried. Furthermore, in the case of *surtaxed mails*, the quantity would necessarily be very small, and if the cost of the small postal aircraft were the present rate—say 30 francs per ton-kilometre—I doubt whether it would pay its way to the same extent as passenger aircraft.

The following recommendations of the Committee apply specially to passenger transport :

" 2. Greater frequency of air services on certain routes.
" 3. Permanence of air services.
" 4. Endeavour to secure greater commercial speed."

I have already examined these points. I would add that, once *general* day air transport were provided in Europe at a rate of 225 km. per hour, it would be difficult to justify the maintenance of *night air postal services*, similarly subsidised, unless such services provided an essential connection with certain *non-daily* long-distance services. Experience has shown that few letters are so urgent that they cannot be delayed for a few hours ; if such be the case, however, there are the telegraph or telephone, or even the taxi-aeroplane let out for hire by a specialised undertaking, to meet such exceptional requirements.

To sum up, I believe in the general introduction of day air services, sometimes almost extending into the night, with very few landings, carried out by the safest fast aircraft at present proposed by technical experts. These services would be indiscriminately available for all traffic ; special measures (" humane " time-tables, extension of life insurance policies in the case of regular air transport,[1] further facilities for heavy baggage, compensation for delay, etc.) should, however, be taken with a view to increasing passenger traffic, which at present provides two-thirds of the receipts and might be *enormously* developed if the service given became more effective.

It is for the purpose of making such services more effective that attention should be given to the recommendation of the Committee as to the " constant endeavour to make the best use of the possibilities of combined transport ". A traveller should—particularly at night—be allowed to make use of a train if he takes a through ticket by air between any two terminal points, should the time of his journey be shortened by taking the train.

It would, further, be most desirable, in order to avoid the sterile competition which is already taking shape, to raise the whole problem of fast transport across Europe. The aeroplane should offer its *co-operation* to the previously established surface means

[1] But not automatic insurance of all passengers, which is a heavy burden on the operating company.

of transport ; in so far as it is also subsidised, air transport has no right—even if it has the means—to set itself up as a stern rival of the railway or of shipping. For the second time I therefore point out to the members of the Sub-Committee that, besides the problem of *combined* transport, the problem of transport by mutual arrangement (" *transports conciliés* ") requires a solution which will have to be dealt with by the Governments.

If such negotiations are undertaken, the question of rates will be raised ; I do not intend to deal with it here. In view of the official replies that have been received, I only desire to lay stress on the serious character of this problem. There is no doubt that the fall in air rates has been brought about by competition between subsidised air companies much more than by the desire of competing with surface transport. The fact remains, however, that, in the period 1930-1933, after allowance has been made for the reductions and rebates currently practised in Europe (books of tickets, etc.), the average one-way rate has fallen from 1 fr. to 0.70 fr. per passenger-kilometre, and from 0.90 fr. to 0.55 fr. in the case of return tickets. I only hope I was no true prophet when I raised before you the spectre of " free transport ".

II. Consequences of Organisation : from the " Pool " to the Denationalised Company.

Last recommendation of the Committee :

" Co-operation between national companies concerned, as the best method of operating international services ".

The inclusion of this passage in the Report is due to inadvertence on the part of myself, the Rapporteur. The above opinion was expressed in the reply of *one* of the members of your Sub-Committee to the questionnaire of November 12th, 1931. Through this oversight, the report of the Sub-Committee (in 1932) gave this individual opinion a general character. I naturally set forth the opinion in question in my preliminary summary, which was an objective review of the opinions expressed. As there was no discussion, and as the view in question was the only one expressed on this matter, it passed on from the initial summary to the report of the Sub-Committee and then to the final Report of the Committee, which gave it the value of a general recommendation.

You will all recall that the question of partial pools, of the complete pool and of the "international company" formed the chief subject of your discussions in 1932. though no agreement was reached. Furthermore, at the second session of the Committee, held at Geneva, May 9th-12th, 1932, the Chairman stated, in connection with the study of the " legal status of an international company ", that, *in spite of the disagreement of members of the Committee on this subject,* there could be no question of the Sub-Committee's interrupting its work on this matter.

The present work having been undertaken at the request of the Sub-Committee, I have thus doubly the right not to feel bound by the " recommendation " of the Committee.

In fact, I feel less than ever that " co-operation between national companies concerned " can provide—particularly in the European area—" the best method of operating international services ".

Already the " average air service " (I do not mean the " average passenger journey ") in 1933 flies over three national territories ; in the near future, with increased speed and radius of action, that number is bound to increase. Above all, the general spread of " direct connections " will lead to a regular system of unvarying routes being replaced by more and more frequent and free undetermined crossings of routes. *The problem will therefore be to give air transport the freedom which is natural to it, but which as yet it has practically not demanded.*

What, then, will be the value of the solution of the " pool ", should the " pool " not be a complete one ? We have seen from our four large maps, where the services provided for by the " pool " are shown in thicker lines, what a small proportion such services still represent. This is not through lack of goodwill, since the present companies themselves—so long as they keep profits separate and distinct from national subsidies—can only benefit from such a system. It is rather incapacity to bring into a common framework national airways which have sometimes a common field of operation, but have no common measure, still less a *common aim.*

I should, however, have been glad to explain here more definitely the real nature of the " pools ", as well technical as administrative and financial. But by its letter of March 7th, 1933, the International Air Traffic Association, which was duly consulted, informed the League of Nations that " particulars concerning ' pools ' should be given by the respective Governments ".

I am all the more ready to believe this, since " pools " are sometimes an indirect means of competition. I have already told the Committee that the *Deutsche Lufthansa,* at the end of 1931, denounced the danger of " Ueberfremdung " (excessive participation of foreign companies in German air transport) which it ran from " pools ", even those negotiated and concluded by itself ; the German company reverted to the subject in 1933 in the same terms. The maximum of subsidies being limited, such " abandoning of traffic to foreign companies " is regarded by the *Lufthansa,* not as an amputation, but as a relief from a burden ; it can thus devote all its efforts to more important traffic or to traffic connected with more ambitious schemes.

* * *

In conclusion, I would once more state that the problem of air transport has not yet been raised in Europe as a matter of public utility.

Is it desired to raise it as such ?

If not, obstacles will arise in the way of the *national aircraft in international transport* ; these obstacles will become more formidable and opposition will be more resolute the more ambitious certain national programmes may appear and the farther they may seem from economic or financial realities, and the more powerful assistance is provided in furtherance of them by the renewal of material.

If the answer is " Yes ", as it should be, the new realities of the situation must be taken into account—namely, a Europe in which aircraft, in order to have that freedom which is natural to them, can no longer follow routes imposed on them and cannot keep to Customs airports, " corridors of approach " or " prohibited zones ".

If aviation were untrammelled, would it be so as far as States are concerned ? Some may desire that it should, but nobody can believe that it would.

Suppose that the technical progress of to-morrow enabled air transport to be financially independent, how could the Governments of a divided and mistrustful Europe allow the indefinite development of a powerful means of transport when aircraft sent on peaceful missions over national territories and to the very heart of those territories may also carry out other missions ? Thus the problem is and remains a political one. It cannot be solved by experts.

* * *

Even if the study of this political problem were not shortly to be undertaken, the task of the Air Transport Co-operation Committee remains an important one, and I hope that this Report—after being brought up to date for 1933 and discussed—may to some extent assist them.

It will further be seen that, up to the last pages, I have always dealt with the present situation without assuming that some political decision may soon make a

radical change in it. With this hypothesis of continuity, subsidised air transport in Europe knows fairly well on what resources it can rely.

Sir Eric Geddes, speaking of subsidies to commercial aviation, said one day that they made it possible to " buy the future ". This may be true, but in Europe it would be true only if the present subsidies were used to multiply direct and fast air services across territory better equipped and more freely accessible.

The future which subsidies would thus buy would be based on co-operation, and necessarily close co-operation. Aviation, therefore, if it won such a victory, would bring to the moral unity of Europe a contribution which would perhaps prove decisive.

Part II

THE EVOLUTION OF AIR TRANSPORT IN EUROPE IN 1933

Part II

THE EVOLUTION OF AIR TRANSPORT IN EUROPE IN 1933

CONCLUSION.

A. Variations in Quantities.

Under the same conditions as in *Chapter I*, and as far as possible on the basis of official replies and documents, I have summarised in *Table XXI* the traffic results in kilometres for 1933.

A comparison with *Table I* shows that, between 1932 and 1933, taking the European network :

The number of kilometres flown increased by 5,070,777, or 17 per cent ;
The number of passenger-kilometres increased by 27,873,642, or 25 per cent ;
The number of ton-kilometres increased by 2,885,806, or 22 per cent. This increase represents 25 per cent on passenger traffic, 18.5 per cent on goods traffic, and 16.5 per cent on mails.

B. Variation in Returns.

To ascertain this variation, I now rely on only one index of comparison, that which in *Chapter I* I called P_2, defined as :

$$P_2 = \frac{\text{Receipts from customers.}}{\text{Total revenue.}}$$

This ratio shows at a glance the degree of *financial autonomy* of the concerns, since, if $P_2 = 1$, the revenue consists, by definition, solely of receipts from customers.

As in 1932, no national contractual air line in Europe had in 1933 reached that stage ; but it will be seen from *Table XXII* that four countries, and not three as in 1932, have reached or passed the ratio $P_2 = 0.5$. In other words, assuming that we take this criterion only, they are more than half the way towards financial autonomy. These countries are : the Netherlands (0.76), Finland (0.70), the United Kingdom (0.61), and Denmark (0.55). In the case of the last-named country, it should be pointed out that we have only the total figure of traffic receipts, and that, as they amounted in 1933 to almost three times the total earned in 1932, it is conceivably possible that a total lump-sum payment for mails, in the nature of a subsidy, was made.

Table XXI.

Regular Air Transport of Subsidised Companies.

Quantities of Transport produced—1933.

(For detailed comparisons see Table I.)

	Kilometres	Passenger-kilometres (1)	Ton-kilometres				
			Passengers (1)	Goods	Mails	Total	Coefficient of utilisation (%)
Germany—Deutsche Lufthansa (Europe)	8,926,355	34,151,128	2,720,000	957,178	185,048	3,862,226	
Austria—"Oelag"	493,649	*1,537,000*	*123,277*	*19,000*	*3,300*	*145,577*	46
Belgium—"Sabena"	1,036,255	2,789,720	223,178	96,785	11,856	331,819	32
United Kingdom—"Imperial Airways" (Europe and London-Egypt)	1,575,000	22,121,000	1,809,680	339,200	211,200	2,360,080	68
Denmark—D.D.L.	209,705	844,275	67,520	19,002	9,605	96,127	
Spain—L.A.P.E.	523,220	2,078,000	166,040	28,700	33,700	228,440	48
Finland—"Aero O.Y."	225,104	781,170	62,494	12,799	11,591	86,884	52
France—Five companies (then, for seven months, Air-France) for the European network	7,468,000	24,653,000	1,968,000	780,000	204,000	2,952,000	53
Greece—S.H.C.A. (E.E.E.S.)	348,609	2,169,680	173,520	50,200	3,692	269,055	70
Hungary—"Malert"	127,730	617,625	49,360	*6,000*	*7,212*	62,572	53
Italy—(European network)	4,763,863	17,407,954	1,392,636	336,428	147,869	1,876,993	42.5
Netherlands—K.L.M. (Europe)	2,211,632	*11,000,000*	*950,893*	*340,000*	*60,000*	1,350,893	54.1
Poland—P.L.L. "Lot"	1,469,469	4,108,763	305,879	105,521	6,738	418,138	40.4
Roumania—L.A.R.E.S.	243,564	*600,000*	*48,000*	*4,000*	*8*	52,008	
Sweden—A.B.A.	371,713	2,869,678	229,520	*60,000*	*54,967*	344,487	70
Switzerland—"Swissair" (international network)	761,100	2,518,525	201,482	23,283	26,459	251,224	47
Czechoslovakia—C.L.S.—C.S.A.	967,600	2,860,139	228,800	82,901	3,063	535,720 (314,764 according to C.I.N.A.)	43
Yugoslavia — "Aeroput"	223,784	503,591	40,280	2,619	113	43,012	
Germany-U.S.S.R.—"Deruluft"	1,216,403	*3,600,000*	*288,000*	*95,000*	*20,208*	403,208	
Whole area considered 1933	34,142,755	137,211,288	11,048,559	3,258,616	1,000,629	15,307,804	
Whole area considered 1932	29,071,978	109,337,646	8,817,000	2,748,326	856,652	12,421,998	
Differences Absol. fig.	5,070,777	27,873,642	2,231,559	510,290	143,977	2,885,806	
Differences Percentage	+ 17%	+25%	+ 25%	+ 18.5%	+ 16.5%	+ 22%	

(1) In this estimate, the passenger (with free luggage allowance) is reckoned at *80 kg.* and not *100 kg.*, the figure adopted in the official statistics of certain countries, which is less in accordance with the facts.

Albania has not been included, as we have only the absolute figures, which are naturally small (*e.g.*, 102,000 km. in 1933) and do not affect this comparative table.

Uncertain figures, whether calculated by analogy or by approximate breaking-up of total figures, are shown in italics.

Table XXII.

COMPARATIVE POSITIONS OF CONCERNS IN 1932 AND 1933, AS REGARDS "FINANCIAL AUTONOMY".

Country	Receipts from customers		Official subsidies		Financial autonomy (P_a)		
	1932	1933	1932	1933	1932	1933	Variation
					%	%	%
GERMANY (1) ..	6,083,124 RM.	*9,569,399* RM.(3)	14,100,000 RM.	17,311,071 RM.	30.1	35.4	+ 4.3
AUSTRIA	446,392 S.	454,474 S.	1,530,000 S.	1,486,500 S.	22.5	23	+ 0.5
BELGIUM	5,824,470 B.f.	5,563,880 B.f.	16,218,522 B.f.	16,549,392 B.f.	26.5	25.2	— 1.3
United Kingdom	**360,000** £	**340,000** £	**200,000** £	**200,000** £	**64.2**	**61**	— **3.2**
DENMARK (2) ..	*150,000* D.c.(3)	423,000 D.c.	350,000 D.c.	350,000 D.c.	*30* (3)	54.6	+*24.6*(3)
SPAIN	603,125 P.	?	3,450,000 P.	?	14.8	?	—
Finland (2) ..	**3,100,704 F.m.**	**3,464,982 F.m.**	**1,943,930 F.m.**	**2,118,900 F.m.**	**61.4**	**70**	+ **8.6**
FRANCE	31,971,701 F.f.	29,300,000 F.f.	124,829,625 F.f.	109,588,000 F.f.	20.3	21	+ 0.7
GREECE	6,428,209 Dr.	7,076,354 Dr.	18,000,000 Dr.	14,752,667 Dr.	26.3	32	+ 5.7
HUNGARY	84,592 Pengö	75,587 Pengö	200,000 Pengö	200,000 Pengö	29.9	27	— 2.9
ITALY	6,658,203 Lire	6,889,255 Lire	72,223,538 Lire	72,377,644 Lire	8.4	8.7	+ 0.3
Netherlands ..	**900,117 Fl.**	**1,241,777 Fl.**	**628,044 Fl.**	**404,268 Fl.**	**58.9**	**76**	+ **17.1**
POLAND	420,710 Zl.	447,993 Zl.	5,312,000 Zl.	5,603,215 Zl.	7.3	7.4	+ 0.1
ROUMANIA	559,522 Lei	615,084 Lei	8,590,000 Lei	?	6.1	?	?
SWEDEN (2)	581,000 S.c.	889,453 S.c.	1,257,000 S.c.	970,500 S.c.	31.6	48	+ 16.4
SWITZERLAND ..	347,230 S.f.	563,733 S.f.	1,474,504 S.f.	1,120,702 S.f.	19	33	+ 14
CZECHOSLOVAKIA	1,749,149 C.c.	2,415,819 C.c.	13,801,510 C.c.	13,860,000 C.c.	11.2	15	+ 3.8
YUGOSLAVIA ..	642,907 Din.	?	6,276,573 Din.	?	9.2	?	?
GERMANY-U.S.S.R.(Deruluft)	618,965 RM.	663,173 RM.	1,851,395 RM.	2,616,912 RM.	25	20.2	— 4.8

(1) In the absence of official information, I have taken the figure for "traffic and other receipts" shown in the 1933 balance-sheet, and have, by analogy with other balance-sheets, deducted about 1/10th—*i.e.*, 1,000,000 RM.; the figure shown under "receipts from customers" is the difference, or 9/10ths of the total revenue shown.

(2) It would be interesting to know how much of the revenue of the Swedish Danish and Finnish lines is derived from mail contracts, so far as the latter involve a lump-sum payment.

(3) In italics, uncertain or estimated figures.

The variations of the index P_2 between 1932 and 1933 are shown in the last columns of *Table XXII*. They are particularly high for the Netherlands (+ 17.1%), Finland (+ 8.6%), Sweden (+ 16.4%), and Denmark (+ 24.6%). There appears to have been substantially no change in the position of the United Kingdom.

These five national lines represent a total of somewhat more than 4 million ton-kilometres actually carried, or about 27 per cent of the European total.

The remaining 73 per cent has been produced in much less satisfactory conditions. The French and Italian lines (31 per cent of the grand total) are practically no nearer financial autonomy. The German lines (25 per cent of the grand total) seem to have improved their autonomy coefficient by about 4 per cent ; but, in the absence of detailed information as to the subsidies, every reservation must be made as to the indirect support (supplies of material, payment for training supernumerary personnel) that may have been received by the Lufthansa.

Apart from Switzerland (+ 13%), the other lines show very small increases or decreases in the autonomy coefficients, which, as a whole, are low ; these national lines form a very small proportion of the whole European system, which of course does not make them any less interesting, but prevents their having any serious influence on the general result that it is my primary object to ascertain.

C. The Resources employed.

1933 was the first year in which the European air lines showed a marked trend towards speedier renewal of material and more intense utilisation of modernised fleets. While the latter, therefore, still continued to consist officially of a comparable number of aeroplanes and seaplanes, served by equally numerous crews, this must be ascribed mainly to what I have already called " statistical overcrowding ". Only the results for 1934, and more particularly for 1935, will enable us to adjudge the efforts made in Europe to reach the " utilisation " percentages of personnel and material which the United States achieved as far back as 1932.

As evidence, it may be pointed out that, on December 31st, 1933, Air-France was certainly not employing more than 100 aeroplanes in Europe (instead of 181 a year earlier), and was getting out of each of them, not, as before, 234 hours' work annually, but at least 400. In Belgium, the S.A.B.E.N.A. had, in 1933, reached the point of getting each of its pilots to fly 438 hours, instead of 375 in 1932. In Italy, the turnover of material increased by 15 per cent between 1932 and 1933, *without any reaction on the personnel.*

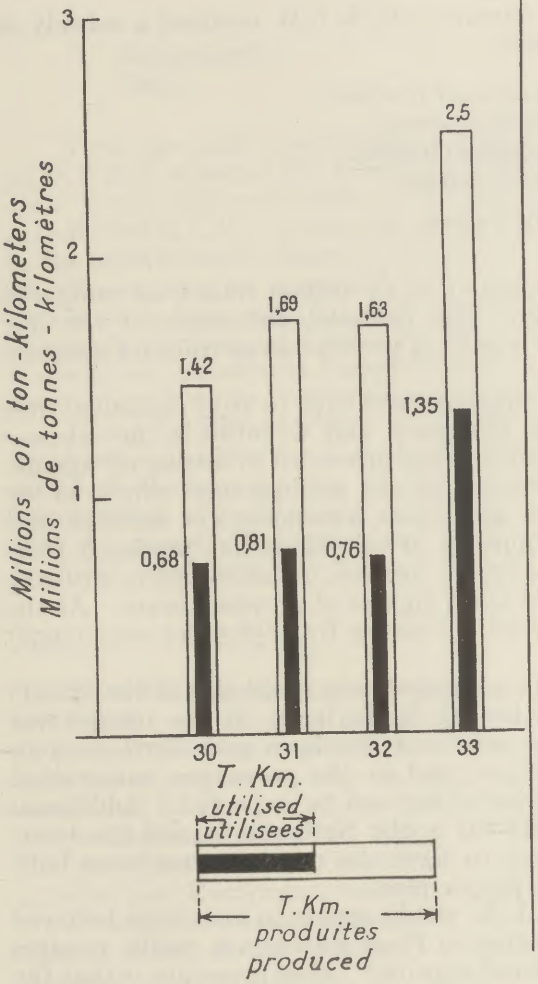
In this connection, it should also be pointed out that most European companies could work with far fewer pilots without reaching the American averages, or even the legal limits, recently fixed at 1,000 hours per pilot per year, in the United States. Governments, however, sometimes impose supernumerary staff on the companies, and oftener still the companies find themselves, in times of depression, unwilling to dismiss good professional pilots, who would be likely to swell the ranks of the unemployed. This, moreover, is not a problem peculiar to commercial aviation ; but it affects the return from air transport as it does other working returns, and must be taken into consideration before rigid conclusions are drawn from statistics alone.

D. Extreme Cases of Air Transport in Europe.

Imperial Airways are possibly second to no other European line as regards economic working. It is, however, difficult, in the case of a concern whose main justification

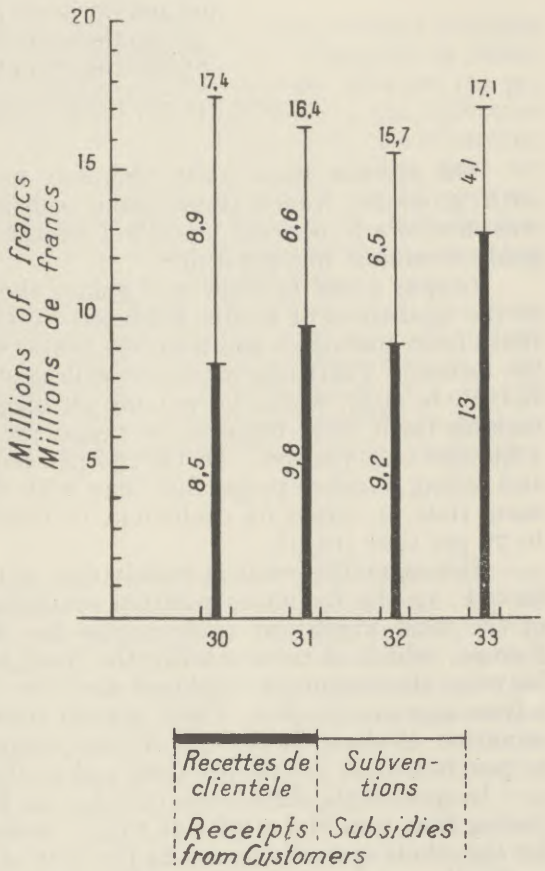
Graph 9.

VOLUME OF TRAFFIC OF THE K.L.M., 1930 TO 1933 INCLUSIVE.



Graph 10.

ECONOMIC RETURN EARNED BY THE K.L.M., 1930 TO 1933 INCLUSIVE.



lies in Imperial communications, to see what advantages the European lines only have over the rest. Moreover, the British Government does not supply separate figures for the revenue earned *by each line* of Imperial Airways.

To get an idea, therefore, of the best achievements of air transport in Europe, the proper way is to analyse the returns of the Netherlands K.L.M. for its European network (omitting the Indies line, even as regards its Amsterdam-Athens-Cairo section).

In 1933, for the whole of its European network, the K.L.M. received a subsidy of 404,268 florins. At the same time it earned :

825,182 florins in *passenger* revenue,
305,406 florins in *goods* revenue,
35,309 florins in *luggage* charges,
75,880 florins in *mail* charges,

or 1,241,777 florins total revenue.

The revenue from traffic therefore amounted to 13 million francs, as compared with 4,100,000 francs Government subsidy. The financial autonomy of the line was therefore 76 per cent, and the Company is only 24 per cent away from its assumed goal—economic independence.

Graphs 9 *and* 10 show at a glance the changes from 1930 to 1933 inclusive, first in the quantities of traffic produced by the Company, and secondly in the revenue (both from customers and from the State) which it has succeeded in setting off against the former. Particular attention will be attracted by the striking achievement of the K.L.M. in 1933, when, by putting on bigger aeroplanes, extending the services, and making them more frequent, it raised the number of ton-kilometres produced from 1,630,000 to 2,500,000. Of this 50 per cent higher number, it succeeded in utilising and selling a higher proportion than with the lower figures of previous years. At the same time, it raised its coefficient of financial autonomy from 58.5 per cent (1932) to 76 per cent (1933).

This splendid result is mainly due to the comparatively small size of the system served ; to the fortunate position occupied by the Netherlands, at the intersection of the most important trade routes for the whole of Northern and North-western Europe, which is economically the most active ; and to the proportion maintained between the resources employed and the results that can be expected. Additional advantages are the Free Trade system traditional in the Netherlands, and the determination of those in control of the Company to have the requisite machines built or purchased, at the proper time and in the proper place.

In spite of the difficulties of 1934, the K.L.M. would appear to have even bettered during that year the results of 1933. According to Press statements, traffic receipts for the whole system covered 82 per cent of total expenses ; what is certain is that the traffic figures show a fresh and very striking increase.

* * *

Taking the question from the standpoint of financial return, commercial air lines such as those in Italy seem to be badly handicapped as compared with the K.L.M. As there can be no question of the *quality* of the personnel and machines, and as such widely different results must be primarily attributed to insuperable differences in economic geography, I have no hesitation in pointing to the following facts. In 1933, the Italian air services—all covering the territory dealt with in my report—produced

4,360,000 ton-kilometres, 1,880,000 of which were utilised, or 40 per cent more than the K.L.M. Yet the Italian revenue from customers does not exceed 9,000,000 francs, as compared with 94,000,000 francs in subsidies. The following table shows the comparison between the two national concerns :

	Per ton-kilometre carried	
	Receipts from customers	Government subsidy
	Francs	Francs
Netherlands	9.60	3.00
Italy	4.75	50.00

Thus, for each ton-kilometre *carried*, the Italian lines require receipts totalling 54.75 francs, whereas the K.L.M. can manage with 12.60 francs. This striking difference is only to a small extent due to the utilisation of the tonnage afforded (54 per cent by the K.L.M., 43 per cent by the Italian lines). It is due more to the difference in the rates actually charged : the K.L.M. earns *twice as much* on every ton-kilometre. Finally, it may be suspected that the machines operated on the Italian lines are expensive to run, and that a great proportion of the ton-kilometres carried pays no, or merely nominal, charges. *In these circumstances, if transport is the real objective of commercial aviation in Europe, it will be seen that the Italian Government pays seventeen times as much as the Netherlands Government per unit of actual transport.*

It will be gathered that, in setting down these figures, I have no desire to make invidious comparisons. I would merely point out that in 1934, as in 1933, the organisation of air transport in Europe is still faced with the same main obstacle : the impossibility of generalising by merely technical action, over the whole of a network that is extremely heterogeneous, the results obtained on certain profitable routes by favoured companies which know how to take advantage of their privileged position.

* * *

No official figures for the whole of 1934 are available as I conclude this survey, but I feel I can say that the advance made in 1933, as compared with 1932, has not as a whole been maintained either in respect of quantity or of quality (quality being, *ex hypothesi*, represented by the degree of financial autonomy) ; the European network considered by the Committee is undoubtedly just as far away from independence, and its economic activity is no higher at the end of 1934, than it was two years earlier. The general reasons for this state of affairs are known ; it should, however, be borne in mind that European commercial aviation, nearly three-fourths of the cost of which is still carried on national budgets, has to that extent been very largely sheltered from what is known as the " slump " ; its subsidies have hardly been reduced at all. It is, however, still waiting for the most valuable gift that it could receive : a doctrine of collective action calculated on a European scale to meet European needs, and based on strictly economic lines.

January 12th, 1935. *(Signed)* Henri BOUCHÉ.

TABLEAU A. — TABLE A.

Temps de parcours en heures, par les transports de surface, entre soixante-sept villes de l'ensemble territorial considéré, prises deux à deux. (Documentation, établie sur questionnaire du rapporteur et à la demande de la Société des Nations, par la Compagnie internationale des Wagons-Lits.)

Time of Journey in Hours, by Surface Transport, between Sixty-seven Towns of the Territorial Area considered, taken Two by Two. (Documentation prepared on the basis of the rapporteur's questionnaire and at the request of the League of Nations by the Compagnie internationale des Wagons-Lits.)

De / From ↓ — à / to →	Londres London	Paris	Amsterdam	Bruxelles Brussels	Anvers Antwerp	Cologne	Hanovre Hanover	Hambourg Hamburg	Copenhague Copenhagen	Malmœ Malmö	Stockholm	Oslo	Helsinki	Tallinn	Leningrad	Strasbourg Strasburg	Francfort-s./Mein Frankfort-on-Main	Nuremberg	Leipzig	Prague	Berlin	Dantzig Danzig	Kœnigsberg	Kaunas	Riga	Moscou Moscow	Varsovie Warsaw	Cracovie Cracow	Lwow	Kiew	Odessa	Cernauti	Bucarest Bucharest	Istanbul	From ↓ — to →
Londres		6¾	11¾	6¼	7¼	11	15 (1)	17½ (1)	31½ (1)	35 (1)	44¼ (2)	47½ (2)	68¼ (3)	51½ (3)	72¼ (3)	15¾ (1)	15 (1)	19 (1)	20½ (1)	29½ (1)	18½ (1)	26½ (1)	29½ (1)	32¾ (1)	39¾ (2)	64¾ (3)	27¼ (1)				65 (3)		49½ (2)	64½ (3)	London.
Paris	6½		7	3¼	4¼	6½	10¼ (1)	12¾ (1)	23 (1)	26½ (1)	36½ (2)	38¾ (2)	64 (3)	46¾ (3)	67¾ (3)	5½	11½ (1)	14 (1)	15¾ (1)	24½ (1)	13¼ (1)	21¾ (1)	24¾ (1)	28 (1)	35 (2)	57½ (2)	22½ (1)				60½ (2)		44 (2)	58¾ (3)	Paris.
Amsterdam	11½	7		3½	3	4¾	6	11 (1)	22¾ (1)		35¼ (2)	37½ (2)	56 (3)			9¾	7	13 (1)	11¼ (1)	22 (1)	8¼	21 (1)		27 (1)	34 (2)	48¾ (2)	21 (1)						43½ (2)	58½ (2)	Amsterdam.
Bruxelles	6½	3¼	3¾		½	3¾	7¾	10¼ (1)	26½ (1)		34½ (1)	36¼ (2)	63¾ (3)			5¾	12 (1)	13¼ (1)	19½ (1)	10¾ (1)	19¼ (1)		25½ (1)	32½ (2)	55¾ (3)	20 (1)						41½ (2)	56¼ (2)	Brussels.
Anvers	7¾	4¾	3	½		4¾		11¼ (1)	28 (1)		32 (2)	35¼ (2)				6½	8¼ (1)	13 (1)	16¾	11¾ (1)														Antwerp.
Cologne	10¾	6½	4	3½	4¼		3½	6¼	16½		30 (2)	32¼ (2)				6	3	7	9	15¾ (1)	7½ (1)	15¼ (1)	18¼ (1)				16 (1)								Cologne.
Hanovre	16 (1)	10½ (1)	6¾	7¾		3¾		2½	12½		26¼ (1)	28½ (1)					5½	8	4½		3	11½	14½												Hanover.
Hambourg	19½ (1)	14 (1)	11 (1)	11¼ (1)	12½ (1)	7¼	2½		10		23 (1)	25¼ (1)	44 (2)		44 (2)	14½	8½	11	5½	11 (1)	2¾	17 (1)	19 (1)				15 (1)						38 (2)	55¼ (3)	Hamburg.
Copenhague	32½ (2)	25 (1)	22½ (1)	27 (1)	28½ (1)	18 (1)	13¼ (1)	10¾		2½	11	14	35 (1)	42¼ (2)	57¼ (2)					19½ (1)	10				28 (1)	52½ (2)	22 (1)						53½ (2)	68½ (3)	Copenhagen.
Malmœ	35¼ (1)	27¼ (1)							2¼		10¼ (1)	12¼ (1)	33 (1)		52½ (2)						10¾				33¼									Malmö.
Stockholm	44½ (2)	37½ (2)	35¾ (2)	35½ (2)	39¾ (2)	30¾ (2)	26 (1)	23¼ (1)	11¼	9½ (1)		11½	21 (1)	26 (1)	41¼ (2)					28¼ (1)	21 (1)		35 (1)	24 (1)	59½ (3)	29½ (1)						66 (3)	81 (4)	Stockholm.
Oslo	47½ (2)	40½ (2)	38¾ (2)	37¾ (2)	42¾ (2)	33¾ (2)	29 (1)	26¼ (1)	14½	12¾ (1)	12		46¾ (2)	66¾ (3)	65¾ (3)					31½ (1)	24 (1)		38¼ (1)	45 (2)	83¼ (4)	32¾ (1)						69 (3)	84 (4)	Oslo.
Helsinki	61½ (3)	68¼ (3)	54¼ (3)	58½ (3)				44½ (2)	33½ (1)	31¾ (1)	22½ (1)	47¼ (2)		4½	14					48½ (2)	43 (2)		36 (2)	23½ (1)	32¾ (2)	45½ (2)						79¼ (4)	100 (5)	Helsinki.
Tallinn	55¾ (3)	51½ (3)							42¼ (2)		26 (1)	52½ (2)	4½		15¾					39 (1)	33¼ (2)	27½ (1)	24¼ (1)	22½ (1)	12 (1)	24¾ (1)	32 (1)								Tallinn.
Leningrad	75½ (3)	71½ (3)						41¾ (2)	59½ (2)	53 (2)	40½ (2)	64¾ (3)	14¼	13½							43¾ (2)	38 (2)	34¾ (1)	33 (1)	18 (1)	9¾ (1)	33½ (1)	43¾ (2)	42½ (2)	30 (1)	39¾ (2)				Leningrad.
Strasbourg	15¾	5¼	9¾	5¾	6½	6¾		14¾										9½ (1)	8¾	17¼	14½													Strasburg.
Francfort-s./Mein	15½	11½	7½	7¾	8¼	3¼	5½	8¼										3½	5	10	3	17½ (1)	17¾											Frankfort-on-Main.
Nuremberg	18¾ (1)	16¾ (1)	13¼ (1)	11½ (1)	12¾ (1)	6¾	8	11								10 (1)	3¼		4¾	7	6	16 (1)	17½ (1)											Nuremberg.
Leipzig	20¼ (1)	16 (1)	11¾ (1)	13½ (1)	17¾ (1)	9	4¼	5¾								10¾ (1)	5	5		5½	1¾	11	11¼				11								Leipzig.
Prague	30¾ (1)	25 (1)	23 (1)	21½ (1)		17¾ (1)		11¼ (1)	18¼ (1)		27 (1)	30¼ (1)	53 (2)	38 (1)		17¼ (1)	10½	7	5½		6½	17¾ (1)	19¼ (1)	23¼ (1)	31¾ (2)	42¼ (2)	13½ (1)	9¾	15½			21½ (1)	39½ (2)	41¼ (2)	Prague.
Berlin	18¼ (1)	14¾ (1)	9½	11 (1)	12 (1)	7 (1)	3	2¼	11½	10½ (1)	20 (1)	23¼ (1)	44 (2)	31 (2)	38¾ (2)	15 (1)	3¼	6	1¾	5¾		8¼	8½	13	21½ (1)	38 (2)	8½	11¾ (1)	17¼ (1)	43¾ (2)	46½ (2)	22½ (1)	33½ (2)	47 (2)	Berlin.
Dantzig	26¾ (1)	22¾ (1)	21½ (1)	20 (1)		16 (1)	12	17 (1)						27¾ (1)	35½ (2)		17¾ (1)	17¼ (1)	10½	17¼ (1)	8¼		3	8	15 (1)	32¾ (2)	7¼	12 (1)	18 (1)						Danzig.
Kœnigsberg	29¾ (1)	25¾ (1)				19 (1)	15	20 (1)						23 (1)	30½ (1)		19½ (1)	17½ (1)	11¼	18½ (1)	8½	3		4¾	11¾ (1)	30½ (1)	10 (1)								Koenigsberg.
Kaunas	32 (1)	27¾ (1)	26 (1)	25 (1)							36¾ (2)	40¼ (2)	26½ (1)	21 (1)	28½ (1)					22½ (1)	13¼	9¼	4¾		6¾ (1)	28½ (1)	15¾ (1)	22¼ (1)	33 (1)	57 (3)	56¾ (3)	39¼ (2)			Kaunas.
Riga	40 (2)	35¾ (2)	34 (2)	33 (2)					28 (1)	32 (2)	24 (1)	45¾ (2)	16¾ (1)	11 (1)	18 (1)					29½ (2)	20¼ (1)	16¼ (1)	12¾ (1)	7¾ (1)		24¾ (1)	16¼ (1)	23 (1)							Riga.
Moscou	67 (3)	57 (3)	48 (2)	50½ (2)					48¼ (2)		57½ (3)	82½ (4)	31¼ (2)	22¾ (1)	9¾ (1)					38 (2)	35¾ (2)	33¾ (2)	28½ (1)	26¾ (1)	22¾ (1)		24 (1)	34½ (2)	33 (2)	23 (1)	39 (2)	38½ (2)	56¼ (3)	83½ (4)	Moscow.
Varsovie	26½ (1)	22¾ (1)	21½ (1)	20 (1)		16		14¼ (1)	24½ (1)		33 (2)	35¼ (2)	37¾ (2)	31 (1)	33 (1)				11	14 (1)	8½	7¼ (1)	11 (1)	14½	16½ (1)	25½ (1)		5½	8½	34 (2)	36¾ (2)	15 (1)	25¼ (1)	46 (2)	Warsaw.
Cracovie															42¾ (2)					9½ (1)	12¾ (1)	11¾ (1)		24 (1)	23¼ (1)	35¼ (2)	5½		5¾	31½ (2)	34¼ (2)	10½	21½ (1)		Cracow.
Lwow															49½ (2)					16	18½ (1)	18 (1)		23¼ (1)		42 (2)	8¼	5¾		23 (1)	25½ (1)	5	16 (1)		Lwow.
Kiew															33¼ (1)						40½ (2)			55¾ (3)		21¼ (1)	36¼ (1)	26 (1)	20¼ (1)		12½ (1)	26½ (1)	37½ (2)		Kiew.
Odessa	63¾ (3)	60¼ (3)													44¼ (2)						44¼ (2)			59¾ (3)		34½ (2)	38¾ (2)	28¾ (1)	22¾ (1)	12¾ (1)		29 (2)	23¼ (1)	39 (2)	Odessa.
Cernauti																				24¼ (1)	24½ (1)			29½ (1)		50 (2)	14½	11	5¾	31½ (2)	34 (2)		9¾		Cernauti.
Bucarest	49 (2)	47½ (2)	43 (2)	41¾ (2)				39 (2)	50¼ (2)		64 (3)	66 (3)	78½ (3)							35¾ (2)	35¾ (2)					61½ (3)	25¼ (1)	22¼ (1)	17 (1)	34 (2)	29¼ (1)	10		20 (1)	Bucharest.
Istanbul	68¼ (3)	61 (3)	61¾ (3)	60½ (3)				56¾ (3)	69½ (3)		83 (4)	85¼ (4)	100 (5)							44½ (2)	49¾ (2)					88½ (4)	52¼ (2)				40 (2)		24¼ (1)		Istanbul.

Note : Le chiffre en italique et entre parenthèses, placé après chaque temps de parcours, indique le nombre de *nuits* incluses dans le voyage.

Note : The italic figure in parentheses placed after each time figure shows the number of *nights* included in each journey.

TABLEAU A. — TABLE A.

Temps de parcours en heures, par les trajectoires de surface, entre scissions-sept villes de l'ensemble territorial considéré, prises deux à deux, (temps-vitesse réelle ou quasi-moyenne du carrefour en 1.h de demande de la période de pointe, par la Compagnie Internationale des Wagons-Lits.)

Time of Journey in Hours, by Surface Trajectory, between Sixty-seven Towns of the Territorial Area considered, taken Two by Two. (Commencement imposed on the basis of the 'approximate speed-maximum and at the request of the Compagnie Internationale des Wagons-Lits.)

TABLEAU B. — TABLE B.

Temps de parcours, en heures, par les transports de surface, entre soixante-sept villes de l'ensemble territorial considéré, prises deux à deux. (Documentation établie, sur questionnaire du rapporteur et à la demande de la Société des Nations, par la Compagnie internationale des Wagons-Lits.)

Time of Journey in Hours, by Surface Transport, between Sixty-seven Towns of the Territorial Area considered, taken Two by Two. (Documentation prepared on the basis of the rapporteur's questionnaire and at the request of the League of Nations by the Compagnie internationale des Wagons-Lits.)

De / à	Vienne Vienna	Budapest	Belgrade	Sofia	Salonique Salonika	Athènes Athens	Ankara	Smyrne Smyrna	Beyrouth Beirut	Le Caire Cairo	Munich	Bâle Basle	Zurich	Genève Geneva	Milan	Venise Venice	Rome	Brindisi	Tunis	Tripoli	Lyon Lyons	Marseille Marseilles	Toulouse	Bordeaux	Barcelone Barcelona	Madrid	Séville	Lisbonne Lisbon	Tanger Tangier	Casablanca	Oran	Alger Algiers	Benghazi	From / to
Londres	30¼ (1)	36 (1)	45¼ (2)	53 (2)	59¾ (2)	71½ (3)	94 (4)	103¼ (4)	117 (4)	154½ (6)	22¾ (1)	19¾ (1)	22¾ (1)	18 (1)	23¼ (1)	27½ (1)	32¼ (1)	42½ (2)	55 (2)	76 (3)	15½	21 (1)	18 (1)	14¾	26¼ (1)	33 (1)	46¾ (2)	41¾ (1)	55 (2)	69 (3)	49 (2)	45½ (2)	92 (4)	London.
Paris	21½ (1)	27 (1)	35½ (2)	43½ (2)	50½ (2)	62¾ (3)	84¾ (4)	93 (4)	109¾ (5)	145¼ (6)	14 (1)	6	8¼	9	14 (1)	18¼ (1)	22½ (1)	34¼ (2)	47½ (2)	66¼ (3)	6½	11¼	9½ (1)	6½	17¾ (1)	22 (1)	37 (2)	29¾ (1)	45¼ (2)	59¼ (2)	42½ (2)	37 (2)	82¼ (4)	Paris.
Amsterdam	21¼ (1)	26¾ (1)	35¾ (2)	44 (2)	50 (2)	62½ (3)	85 (4)		107½ (5)	145 (6)	14½ (1)	10¾	12½	16¾	20 (1)	25½ (1)	73 (2)	39¼ (2)			14½	20 (1)	19 (1)	16½ (1)	27¼ (1)	30½ (1)	44¼ (2)	44¾ (2)	53¾ (2)					Amsterdam.
Bruxelles	18¾ (1)	24¼ (1)	33¼ (2)	41¼ (2)	47¼ (2)	60¼ (3)	82½ (4)		105½ (5)	144 (6)	14½ (1)	7¼	9	16½ (1)	16½ (1)	22 (1)	32¼ (2)	40½ (2)			10½	16 (1)	15 (1)	12½ (1)	23½ (1)	27¼ (1)	41 (2)	40 (2)	49¾ (2)	63¾ (3)		42¾ (2)		Brussels.
Anvers	19¾ (1)	25¼ (1)									15½ (1)	8	10	17¼ (1)	17¼ (1)	22½ (1)	33¼ (2)	41½ (2)			11½	17 (1)												Antwerp.
Cologne	14¾ (1)	20½ (1)									8½	6½	8¼	12	18½ (1)	24 (1)	31 (2)	35½ (2)			14½	22 (1)												Cologne.
Hanovre	17½ (1)	26 (1)									10	10¾	13	18 (1)	20¼ (1)	25½ (1)	32¾ (2)																	Hanover.
Hambourg	21 (1)	28½ (1)									12¾	13¾	16	20½	23¼ (1)	28¾ (1)	35¾ (2)																	Hamburg.
Copenhague	26 (1)	35 (1)	44½ (2)	53½ (2)		72 (3)	94½ (4)			155 (6)	21¾ (1)	25)1)	29 (1)	35¾ (2)	37¾ (2)	43¾ (2)	47¾ (2)				32¾ (1)	42 (2)				57 (3)		64¾ (3)						Copenhagen.
Malmœ	28½ (1)	38 (1)												33 (2)			48¾ (2)																	Malmö.
Stockholm	38¾ (2)	46¾ (2)	58 (3)	66½ (3)		85¼ (4)	107¾ (5)			168¾ (7)	34½ (2)	37½ (2)	39¼ (2)	42¾ (2)	46½ (2)	55¾ (2)	57¾ (3)				45¼ (2)	54½ (3)				68¾ (3)		76½ (3)						Stockholm.
Oslo	41½ (2)	48 (2)	60½ (3)	69 (3)		87½ (4)	110 (5)			170½ (7)	37¼ (2)	40½ (2)	42¼ (2)	45¾ (2)	49 (2)	57¼ (2)	61½ (3)				48¼ (2)	57½ (3)				72 (3)		79¾ (3)						Oslo.
Helsinki	57 (2)	64½ (2)												61¾ (3)			77½ (3)																	Helsinki.
Tallinn	47¼ (2)	55¾ (3)												55 (3)			68½ (3)																	Tallinn.
Leningrad	49½ (2)	54¼ (2)												64½ (3)			79¼ (3)																	Leningrad.
Strasbourg	15 (1)	20½ (1)							101½ (5)		7 (1)	1½	3¼	8¾	10¾ (1)	16 (1)	23 (1)	30½ (1)	53¼ (2)		8	13 (1)	19 (1)	16¼ (1)	27¼ (1)				52¼ (2)	66¼ (3)	53¼ (2)	45¼ (2)		Strasburg.
Francfort-s./Mein	11½	17									5½	5½	7¼	10¾	14	19½ (1)	30½ (1)	31¼ (1)			12¼ (1)	17¾ (1)												Frankfort-on-Main.
Nuremberg	7¾	13½									2½	7¼	9¼	16¾ (1)	18½ (1)	24¾ (1)	28½ (1)	33¼ (1)																Nuremberg.
Leipzig	12¾ (1)	15½	23½ (1)	32 (1)	38 (1)	51 (2)				133 (5)	7½	10½	12	17¾ (1)	19½ (1)	25½ (1)	31¾ (1)	38½ (2)			18¾ (1)	24 (1)				48¾ (2)		56½ (2)						Leipzig.
Prague	6¼	8¾	17½ (1)	26 (1)	32¼ (1)	45 (2)	66 (3)	77½ (4)	90¼ (4)	127½ (5)	8¼	23¾ (1)	22½ (1)	29 (1)	30¾ (1)	23½ (1)	34½ (1)	58 (3)	81 (3)	104½ (5)	34¾ (1)	42 (2)	41 (2)	36 (1)	49½ (2)	56¼ (2)	70 (3)	74½ (3)	78¼ (3)	92¼ (4)	74¼ (3)	69½ (3)	104½ (5)	Prague.
Berlin	12½	14¾	23½ (1)	32 (1)	38¼ (1)	51 (2)	72 (3)	83½ (4)	96 (4)	133½ (5)	9¼	12	14	19½	21 (1)	19¾ (1)	28½ (1)	41 (2)	68¾ (3)	89½ (4)	21 (1)	26 (1)	30 (2)	23¼ (1)	37¼ (2)	45 (2)	58¾ (3)	55 (2)	67 (3)	81 (4)	62½ (3)	57 (3)	105½ (5)	Berlin.
Dantzig	22 (1)	25 (1)	32 (2)	41½ (2)		60½ (3)					18¾ (1)			27¼ (1)			43 (2)																Danzig.
Kœnigsberg	21¾ (1)	24¾ (1)									19¾ (1)			28¼ (1)			44 (2)																Koenigsberg.
Kaunas	26¾ (1)	29¾	37¾ (2)	46 (2)		65¼ (3)	87 (4)			147½ (6)	24½ (1)			33 (1)			49 (2)																Kaunas.
Riga	32¼ (1)	35 (1)	43 (2)	51½ (2)		70¾ (3)	92½ (4)			151¼ (6)	31¾ (1)			40¼ (2)			57 (2)																Riga.
Moscou	49¾ (2)	56½ (3)	81¾ (4)	91 (4)	97¼ (4)	108¼ (5)	130 (6)			190¾ (8)	48¾ (2)	50¼ (2)	56 (3)	56 (3)	63 (3)	67½ (3)	73 (3)									82¼ (4)		90 (4)	115¼ (5)	129¼ (6)	112 (4)	106½ (4)	153¾ (7)	Moscow.
Varsovie	13	19¾ (1)	36 (2)	44½ (2)	50½ (2)	63½ (3)	85½ (4)			146 (6)	19¾ (1)	23 (1)	24¾ (1)	28¼ (1)	31½ (1)	39¾ (2)	43¼ (2)									58¼ (3)		66 (3)	77½ (3)	91¼ (4)	73½ (4)	68 (3)	114½ (5)	Warsaw.
Cracovie	9¾	17¾ (1)	30¼ (1)	38½ (2)										32¾ (2)																			Cracow.
Lwow	18¾ (1)	26¾ (1)	39¼ (2)	47½ (2)										41¾ (2)																			Lwow.
Kiew	39 (2)	47 (2)												63¼ (3)																			Kiew.
Odessa	41¾ (2)	49¾ (2)				89¾ (4)	111½ (5)			173 (7)				65¾ (3)																			Odessa.
Cernauti	28½ (1)	36¼ (1)												47 (2)																			Cernauti.
Bucarest	21¼ (1)	16 (1)	25 (1)	33½ (1)	39½ (1)	52½ (2)	39¾ (2)			124½ (5)	29½ (1)			47 (2)	38 (1)	32 (1)	41¼ (1)																Bucharest.
Istanbul	41½ (2)	33½ (2)	24½ (1)	15¾ (1)	27½ (1)	26 (1)	16½ (1)	32¾ (1)	48 (2)	85½ (3)	48¾ (2)			57 (3)	47¾ (2)	41 (2)	50½ (2)	53 (2)		174 (7)													Istanbul.

TABLEAU B. — TABLE B.

Temps de parcours, en heures, par les transports de surface, entre certaines villes de l'Amérique (territoriaux canadiens, prises deux à deux. (Service mondial établi par correspondance de réponses, de la direction de la Société des Nations par la radiophonie internationale des Nations Unies.)

Time of Journey in Hours, by Surface Transport, between Certain Towns of the Territorial Area considered, taken Two by Two. (Universal Service established on the basis of the correspondence questionnaire sent out on the request of the League of Nations by the Independent International Broadcasting Union.)

TABLEAU C. — TABLE C.

Temps de parcours en heures, par les transports de surface, entre soixante-sept villes de l'ensemble territorial considéré, prises deux à deux. (Documentation établie, sur questionnaire du rapporteur et à la demande de la Société des Nations, par la Compagnie internationale des Wagons-Lits.)

Time of Journey in Hours, by Surface Transports, between Sixty-seven Towns of the Territorial Area considered, taken Two by Two. (Documentation prepared on the basis of the rapporteur's questionnaire and at the request of the League of Nations by the Compagnie internationale des Wagons-Lits.)

De / From ↓ — à / to →	Vienne Vienna	Budapest	Belgrade	Sofia	Salonique Salonika	Athènes Athens	Ankara	Smyrne Smyrna	Beyrouth Beirut	Le Caire Cairo	Munich	Bâle Basle	Zurich	Genève Geneva	Milan	Venise Venice	Rome	Brindisi	Tunis	Tripoli	Lyon Lyons	Marseille Marseilles	Toulouse	Bordeaux	Barcelone Barcelona	Madrid	Séville	Lisbonne Lisbon	Tanger Tangier	Casablanca	Oran	Alger Algiers	Benghazi	
Vienne		4¼	13¼ (1)	21¾ (1)	27¾ (1)	40½ (2)	62½ (3)		85¾ (4)	123¼ (5)	7¼	15 (1)	13¾ (1)	19½ (1)	22 (1)	14	26¼ (1)				24½ (1)	31¾ (1)			47¼ (2)	49 (2)		56¾ (2)						Vienna.
Budapest	4¼		7½ (1)	16 (1)	22 (1)	35 (2)	56¾ (3)		80 (4)	117½ (5)	13	19¾ (1)	18½ (1)	28¼ (1)	21¾ (1)	18 (1)	27¾ (1)				30 (1)	47½ (1)			52¾ (2)	57¼ (3)		65¼						Budapest.
Belgrade	15¼ (1)	8 (1)		8	14	25½ (1)	48½ (2)			109½ (4)				32¾ (2)	21 (1)	16½ (1)	26 (1)									60 (3)		67¾ (3)						Belgrade.
Sofia	24½ (1)	18½ (1)	8½			40 (2)	40½ (2)			101½ (4)				41 (2)	30¼ (1)	25¾ (1)	35 (1)									68¼ (3)		76 (3)						Sofia.
Salonique	31 (1)	24 (1)	15			12¼ (1)	82¼ (3)	39½ (2)	63½ (3)	58½ (3)				47¾ (2)			41½ (1)	39½ (2)	105½ (5)			60¾ (2)												Salonika.
Athènes	43½ (2)	36½ (1)	27½ (1)	41¼ (2)	12¼ (1)		62½ (3)	22 (1)	44 (2)	43 (2)				59½ (3)	49¼ (2)	44¾ (2)	53 (2)	26½ (1)	91½ (4)			72½ (3)				87¼ (4)		94½ (4)						Athens.
Ankara	67¼ (3)	60¼ (3)	51¼ (2)	42½ (2)	83¾ (4)	65 (3)		30¾ (1)	62 (3)	99½ (4)				84 (4)			77¾ (3)									111¼ (5)		119 (5)						Ankara.
Smyrne					39½ (2)	22 (1)	31½ (1)		71¾ (3)	109¼ (4)				93½ (4)								106½ (4)												Smyrna.
Beyrouth	92¼ (4)	85¼ (4)			66¾ (3)	43 (2)	63¾ (3)	49¼ (2)		32½ (1)				108¾ (5)			102¾ (4)	118¾ (5)			117¾ (5)	121¾ (5)	124½ (5)	122¾ (5)		136 (6)								Beirut.
Le Caire	116¼ (5)	109¼ (5)	100¼ (4)	91½ (4)	59 (3)	43 (2)	87¾ (4)	73¼ (3)	18½ (1)					136 (6)			126¾ (5)	141¾ (6)				143½ (6)				157¾ (7)		165½ (7)						Cairo.
Munich	7¼	13										7½	6½	11¾	12 (1)	11 (1)	20½ (1)	28¾ (1)			16¾	23 (1)	25½ (1)	22¾ (1)	36 (1)	41¼ (2)	53¾ (2)	49 (2)						Munich.
Bâle	14¾ (1)	19½ (1)									7¾		1½	4¼	7	12½ (1)	19¼ (1)	26 (1)			8¼	15½ (1)	19 (1)	16¾ (1)	27½ (1)	33¼ (1)	47 (2)	41 (2)						Basle.
Zurich	13½	18¼									6¾	1½		4½	6	11¾ (1)	18 (1)	24¾ (1)			8¾	16½ (1)	21½ (1)	18¾ (1)	29¾ (1)	36½ (1)	50¼ (2)	42¼ (2)						Zurich.
Genève	21 (1)	29 (1)	30½ (2)	38¾ (2)	45¾ (2)	57¾ (3)	79¾ (4)	92¾ (5)	104¾ (5)	40¼ (6)	12½	4½	5		7¼	10¾	19¾ (1)	25¾ (1)	49 (2)	65¾ (3)	3¼	8	23¾ (1)	17¾ (1)	23 (1)	35¼ (2)	47¾ (2)	43 (2)	57¼ (2)	70 (3)	48¾ (2)	39 (2)	79¾ (4)	Geneva.
Milan	21¾ (1)	23½ (1)	21¼ (1)	29¼ (1)		48½ (2)					12½ (1)	7½	6½	7¾		3	10½ (1)	15¾ (1)		56¼ (2)	12½	12¾	23¼ (1)	24½ (1)	28 (1)	47¾ (2)	59¾ (2)	48¾ (2)					70¼ (3)	Milan.
Venise	14¾	19 (1)	17 (1)	25 (1)		44¼ (2)					12¼ (1)	11¼	10	12¾	3		9½	15½ (1)		56½ (2)	16¼	20 (1)				56 (3)		55½ (2)					70½ (3)	Venice.
Rome	25¾ (1)	34 (2)	31¾ (2)	40 (2)	46 (2)	59 (3)	80¾ (4)		104 (5)	141½ (6)	20 (1)	19½ (1)	18¼ (1)	22½ (1)	10¼	9½		12 (1)	36½ (2)	43 (2)	24¾ (1)	21 (1)	33½ (2)	36¾ (2)	38 (2)	57 (3)	69½ (3)	54¾ (2)	88¾ (4)			50 (2)	57 (3)	Rome.
Brindisi					62¼ (3)	26½ (1)			112½ (5)	150 (6)	30 (1)	30¼ (1)	29 (1)	28 (1)	18½ (1)	18½ (1)	12¼ (1)		37¾ (2)	43¼ (2)	35¼ (2)	31 (1)	43 (2)								63¾ (3)	59¼ (2)	Brindisi.
Tunis					108 (5)	72 (3)								46½ (2)			36¼ (2)	46½ (2)			39 (2)	29 (1)	45½ (2)	49½ (2)						70½ (3)	46¼ (2)	34¼ (1)		Tunis.
Tripoli														70 (3)	59¼ (2)	60 (2)	47 (2)	55½ (2)				75½ (3)											Tripoli.
Lyon	25½ (1)	31 (1)							114 (5)		18 (1)	8½	9	3	10¾ (1)	15¼ (1)	25¼ (1)	33½ (2)	39¼ (2)			4¼	10½	12½	16¼ (1)	40 (2)		47¾ (2)	58¾ (2)	72¾ (3)	44½ (2)	35 (2)		Lyons.
Marseille	33¼ (2)	40¼ (2)			55 (2)	66¾ (3)		97½ (4)	114½ (5)	149¾ (6)	22¾ (1)	16½ (1)	16¾ (1)	8½	12¾	16	18¼ (1)	31 (1)	32 (1)	67½ (3)	4¼		7¼	11¼	13 (1)	32¾ (2)		40½ (2)	57¾ (2)	71¾ (3)	38 (1)	25 (1)		Marseilles.
Toulouse									133 (6)		26½ (1)	21½ (1)	23¾ (1)	15¼ (1)	24¼ (1)		29½ (1)	40¾ (2)	46¼ (2)		11¼ (1)	7¼ (1)		3¾	8¾	24¼ (1)	34 (1)	28¾ (1)	50¼ (2)	64¼ (3)	32½ (1)	27 (1)		Toulouse.
Bordeaux									121 (5)		23½ (1)	15¼ (1)	17½ (1)	18½ (1)	20½ (1)		30 (1)		50¼ (2)		13	10¾	3½		15¾ (1)	15¼ (1)	29 (2)	23½ (1)	37¼ (2)	51¼ (3)	40 (2)	34½ (2)		Bordeaux.
Barcelone	48¼ (2)	55 (2)									37 (1)	25½ (1)	26 (1)	25 (1)	26¾ (1)		32 (1)				16½ (1)	13½ (1)	7½	14 (1)		13 (1)	24¼ (1)	28 (1)	45 (2)	59 (3)	43 (2)	37½ (2)		Barcelona.
Madrid	47¼ (2)	55¼ (3)	70¼ (3)	78¼ (3)		97½ (4)	119½ (5)		144½ (6)	180 (7)	39 (2)	33¼ (1)	35½	33 (1)	42¾ (2)	46 (2)	48 (2)				36½ (2)	31¾ (2)	21½ (1)	15¼ (1)	13 (1)		10 (1)	13	19½ (1)	33½ (2)				Madrid.
Séville											52 (2)	45½ (2)	47¾ (2)	46½ (2)	56¾ (2)		62 (2)						34½ (1)	28¼ (1)	24 (1)	11 (1)		13¼	18¼ (1)	32¼ (2)				Seville.
Lisbonne	71¾ (3)	78½ (3)	90¼ (4)	98¼ (4)		117½ (5)	139½ (6)			200 (7)	48 (2)	40¾ (2)	43 (2)	43 (1)	49¾ (2)	56 (2)	58 (2)				46½ (2)	41¾ (2)	30½ (1)	24¼ (1)	32¾ (1)	14½	13¾	23 (1)	39 (2)				Lisbon.
Tanger														58¾ (2)			85¾ (3)				60¼ (2)	56¾ (2)	49½ (2)	40½ (2)	38¾ (1)	23½ (1)	23 (1)	23 (1)		9¾ (1)	25½ (1)	34 (2)		Tangier.
Casablanca														70¼ (3)					71¾ (3)		71¾ (2)	68¼ (3)	61 (3)	52 (3)	50 (2)	35 (2)	34½ (2)	40 (2)	9¼ (1)		25½ (1)	34 (2)		Casablanca.
Oran														46 (2)					47¼ (2)		41½ (2)	36 (2)	32½ (1)	39 (2)	43 (2)				22¼ (1)	23 (1)		9½ (1)		Oran.
Alger														36½ (1)		53 (2)	52 (2)	68 (3)	36¾ (1)		32 (2)	24 (1)	26½ (1)	33 (2)	37 (2)				33 (2)	33¾ (2)	9¾ (1)			Algiers.
Benghazi														84 (4)	74¼ (3)	75½ (3)	62 (2)	67½ (3)																Benghazi.

Note : Le chiffre en italique et entre parenthèses, placé après chaque temps de parcours, indique le nombre de *nuits* incluses dans le voyage.

Note : The italic figure in parentheses placed after each time figure shows the number of *nights* included in each journey.

TABLEAU C. — TABLE C.

TABLEAU D. — TABLE D.

Temps de parcours en heures, par les transports de surface, entre soixante-sept villes de l'ensemble territorial considéré, prises deux à deux. (Documentation établie, sur questionnaire du rapporteur et à la demande de la Société des Nations, par la Compagnie internationale des Wagons-Lits.)

Time of Journey in Hours, by Surface Transport, between Sixty-seven Towns of the Territorial Area considered, taken Two by Two. (Documentation prepared on the basis of the rapporteur's questionnaire and at the request of the League of Nations by the Compagnie internationale des Wagons-Lits.)

De / à	Londres London	Paris	Amsterdam	Bruxelles Brussels	Anvers Antwerp	Cologne	Hanovre Hanover	Hambourg Hamburg	Copenhague Copenhagen	Malmö Malmö	Stockholm	Oslo	Helsinki	Tallinn	Leningrad	Strasbourg Strasburg	Francfort-s./Mein Frankfort-on-Main	Nuremberg	Leipzig	Prague	Berlin	Dantzig Danzig	Königsberg	Kaunas	Riga	Moscou Moscow	Varsovie Warsaw	Cracovie Cracow	Lwow	Kiew	Odessa	Cernauti	Bucarest Bucharest	Istanbul	From / to
Vienne	29 (1)	20¾ (1)	20¾ (1)	19¾ (1)	20¾ (1)	15 (1)	17½ (1)	21 (1)	25 (1)	28¼ (1)	40¼ (2)	40½ (2)	57¼ (2)	48 (2)	48¾ (2)	14½ (1)	11½	8	13¼ (1)	6¼	12½	23 (1)	23¼ (1)	28¼ (1)	35¼ (1)	57½ (3)	13	9¼	15 (1)	41 (2)	43¾ (2)	20¾ (1)	21¾ (2)	36¾ (2)	Vienna.
Budapest	34½ (1)	26 (1)	26 (1)	24½ (1)	25¾ (1)	20 (1)	26¼ (1)	29 (1)	32½ (1)	35 (1)	48½ (2)	50¾ (2)	65¼ (2)	55¼ (3)	56¼ (2)	20 (1)	17	13½	15½	9¾	15¾	23½ (1)	24¾ (1)	30¼ (1)	36¼ (1)	59½ (3)	20¼ (1)	16½ (1)	22¼ (1)	48½ (2)	51¼ (2)	28¼ (1)	16½ (1)	31 (2)	Budapest.
Belgrade	46¼ (2)	36¾ (2)	36¾ (2)	35¼ (2)					44 (2)		57¾ (3)	60 (3)							24 (1)	19 (1)	25 (1)	33 (2)		39½ (2)	44½ (2)	82¾ (4)	36 (2)	26¼ (2)	32¼ (2)				23 (1)	23 (1)	Belgrade.
Sofia	54¾ (2)	45 (2)	44½ (2)	44½ (2)					53½ (2)		67 (3)	69¼ (3)							34 (1)	28½ (1)	34½ (1)	42 (2)		48¾ (2)	52¾ (2)	92 (4)	45¼ (2)	35½ (2)	40½ (2)				34 (1)	15 (1)	Sofia.
Salonique	61 (2)	51¾ (2)	52½ (2)	51 (2)															40½ (1)	34¾ (1)	40¾ (1)					98½ (4)	51¾ (2)						40½ (1)	26 (1)	Salonika.
Athènes	72¾ (3)	63½ (3)	65 (3)	63½ (3)					72 (3)		85¾ (4)	87¾ (4)							53¼ (2)	47½ (2)	53½ (2)	61¼ (3)		67¾ (3)	73 (3)	111 (5)	64¼ (3)				89½ (4)		53 (2)	26 (1)	Athens.
Ankara	97¼ (4)	88 (4)	89 (4)	87½ (4)					98½ (4)		110 (5)	112¼ (5)								71 (3)	77¼ (3)			91½ (4)	96½ (4)	134¾ (6)	88 (4)				113 (5)		64¼ (3)	16¼ (1)	Ankara.
Smyrne	106¾ (4)	97½ (4)																		81 (4)	87 (4)													34¾ (1)	Smyrna.
Beyrouth	121 (5)	112¾ (6)	114 (6)	112¾ (6)												107½ (5)				96 (4)	102 (4)													50¼ (2)	Beirut
Le Caire	143¾ (6)	134½ (6)	136 (6)	134 (6)					145¼ (6)		159 (7)	159 (7)							126 (5)	120 (5)	126 (5)			140½ (6)	147½ (6)	184½ (8)	137½ (6)				162 (7)		113¼ (5)	74¼ (3)	Cairo.
Munich	22¼ (1)	14 (1)	15 (1)	15½ (1)	17 (1)	8½	9¾	12½	22 (1)		34 (2)	36¼ (2)				6¾ (1)	5¼	2¼	7¾	7¾	9¼	18¼ (1)	19¾ (1)	24¾ (1)	30 (1)	48¾ (2)	20 (1)						30 (1)	45 (2)	Munich.
Bâle	20 (1)	6¾	10¾	7¾	8	6¾	10¾	13½	26¼ (1)		39 (2)	40¼ (2)				1½	5¾	7	10½	23¾ (1)	12					57¼ (3)	24¾ (1)								Basle.
Zurich	20¼ (1)	9	12¾	9¾	10	8¾	13	16	26¼ (1)		40¾ (2)	42 (2)				3½	7½	8½	12¼	22 (1)	14¼					60 (3)	26½ (1)								Zurich.
Genève	18½ (1)	9¼	15½	17¾ (1)	18 (1)	11½	16	19	34½ (1)	31¼ (2)	48 (2)	48¾ (2)	63½ (3)	53 (3)	55½ (3)	7½	12 (1)	16½ (1)	15	27¼ (1)	19 (1)	26¼ (1)	28 (1)	33 (1)	38 (2)	63 (3)	29½ (2)	31 (2)	36½ (2)	69½ (3)	72 (3)	41¾ (2)	45½ (2)	53¾ (3)	Geneva.
Milan	24 (1)	14½ (1)	19¾ (1)	17¾ (1)	18½ (1)	15¾ (1)	20 (1)	23 (1)	32¾ (2)		46½ (2)	51 (2)				10½ (1)	14	15¾ (1)	20¾ (1)	30¾ (1)	21 (1)					65¼ (3)	33¾ (2)						36½ (2)	45½ (2)	Milan.
Venise	28½ (1)	19 (1)	26 (1)	22½ (1)	23 (1)	21 (1)	25½ (1)	28½ (1)	41¼ (2)		55 (2)	57 (3)				15½ (1)	19½ (1)	20 (1)	25½ (1)	23¼ (1)	20¾ (1)					71¼ (3)	39 (2)						32 (1)	40½ (2)	Venice.
Rome	31¾ (1)	22¾ (1)	38¾ (2)	34 (2)	35 (2)	26 (1)	30½ (1)	33½ (1)	44¼ (2)	48¼ (2)	58 (3)	68 (3)	78 (3)	65¾ (3)	73 (3)	20¾ (1)	27¾ (1)	24¼ (1)	32½ (1)	34¼ (2)	31¼ (1)	43½ (2)	45 (2)	49¾ (2)	56¼ (2)	81 (4)	44 (2)				83 (4)		46¾ (2)	55 (3)	Rome.
Brindisi	44½ (2)	36¼ (2)	40¾ (2)	42 (2)	43¾ (2)	36 (2)										31¾ (1)	31¼ (1)	34½ (1)	39½ (2)	59½ (3)	41¾ (2)													54 (2)	Brindisi.
Tunis	54 (2)	46 (2)														44¾ (2)				79¼ (3)	59¼ (2)													Tunis.
Tripoli	81 (3)	71¾ (3)																		102¾ (5)	84 (3)												132½ (5)	Tripoli.
Lyon	14	6½	15¾ (1)	12 (1)	13 (1)	14½ (1)			30½ (1)		44 (2)	46¼ (2)				7¾	13 (1)		19½ (1)	32 (1)	21 (1)														Lyons.
Marseille	19½ (1)	11¼	21 (1)	17 (1)	18 (1)	21½ (1)			35½ (2)		49 (2)	51¾ (2)				12½	18¼ (1)		25 (1)	42¾ (2)	26½ (1)														Marseilles.
Toulouse	18 (1)	10¾ (1)	17¾ (1)	14 (1)												20¼ (1)				43¼ (2)	25¼ (1)														Toulouse.
Bordeaux	14½	6½	16¾ (1)	12¾												15 (1)				33½ (1)	25 (1)														Bordeaux.
Barcelone	26 (1)	18¼ (1)	27½ (1)	23¾ (1)												29¼ (1)				51¼ (2)	36 (1)														Barcelona.
Madrid	31½ (1)	21¾ (1)	32 (1)	27¾ (1)					55 (3)		65¾ (3)	71 (3)							42½ (2)	54¾ (2)	44 (2)					81½ (4)	55¼ (3)								Madrid.
Séville	41¾ (2)	34½ (2)	44¾ (2)	40 (2)																67 (3)	55 (3)														Seville.
Lisbonne	50¼ (2)	32 (1)	46 (2)	41½ (2)					65¼ (3)		75¾ (3)	79¼ (3)							52¾ (2)	72¼ (3)	53½ (2)					91¾ (4)	65½ (3)								Lisbon.
Tanger	57½ (2)	48¼ (2)	57 (2)	53¼ (2)												57¾ (2)				80¾ (3)	70 (3)					119 (5)	80¼ (3)								Tangier.
Casablanca	69 (3)	59¾ (3)		64¾ (3)												69¼ (3)				92¼ (4)	81½ (4)					130½ (6)	91¾ (4)								Casablanca.
Oran	51 (2)	43 (2)														51½ (2)				76¼ (3)	58 (2)					114½ (4)	75¾ (3)								Oran.
Alger	45 (2)	37 (2)		43¼ (2)												44¾ (2)				69¾ (3)	52 (2)					108½ (4)	69¾ (3)								Algiers.
Benghazi	94 (4)	84¾ (4)																		105¼ (5)	107 (5)					156¼ (7)	116¾ (5)								Benghazi.

Note : Le chiffre en italique et entre parenthèses, placé après chaque temps de parcours, indique le nombre de *nuits* incluses dans le voyage.

Note : The italic figure in parentheses placed after each time figure shows the number of *nights* included in each journey.

TABLEAU D. — TABLE D.

Temps de parcours en heures, par les trains-poste de matinée, entre minuit et midi, de la capitale de l'ensemble territorial considéré, prise dans le sens direct. (Correspondance établie, par correspondance, de chaque train-poste avec le train-poste de la journée, par le contrôleur international de service.)

Time of Journey in Hours, by Postal Trains, between Sixty-seven Towns of the Territorial Area considered, taken Two by Two. (Correspondence prepared, on the basis of the Inspector's questionnaire and at the request of the Bureau of Railways by the Compagnie Internationale des Wagons-Lits.)

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