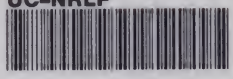
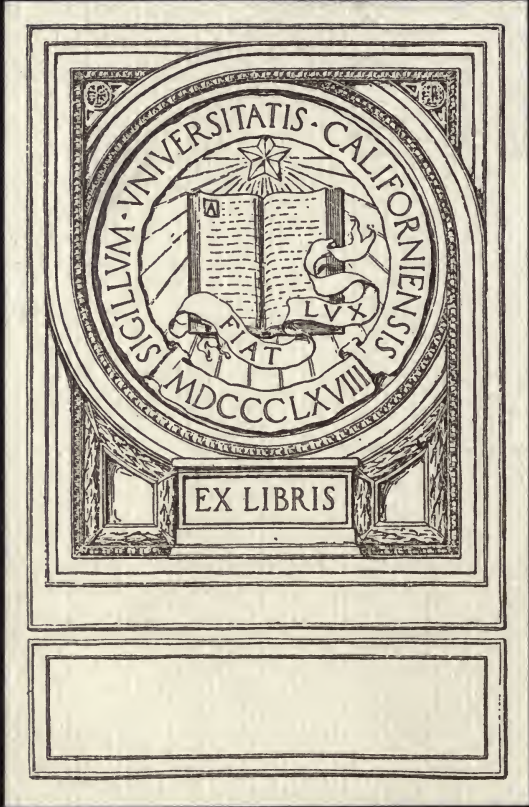


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PERMANENT INTERNATIONAL ASSOCIATION
OF
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COLLECTION

OF

QUESTIONS FOR CONSIDERATION

PREPARED IN ACCORDANCE WITH A DECISION
OF THE PERMANENT INTERNATIONAL BOARD OF THE CONGRESSES OF NAVIGATION
ON JULY 30, 1910

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Executive Committee — Office of the Secretary General
38, Rue de Louvain, 38
Brussels

NOTICE

Members of the Association who may desire to treat any of the questions contained in the present collection, are requested to submit their articles to the *First Delegate* of their country on the Permanent International Board of the Congresses of Navigation for his opinion thereon. If this opinion be favorable and be ratified by the *Executive Committee*, the latter will, in conformity with Art. 10 of the by-laws, see to the printing of the article sent in and to its distribution to the members of the Association.

The object of the articles is not limited strictly to the following series of questions, as *the Permanent Board* intends to allow a great deal of liberty in the choice of subjects.

QUESTIONS FOR EXAMINATION

1st Section Inland Navigation

1. Establishments and plants for hydraulic experiments.
2. Account of new researches carried on to determine the resistance of vessels to traction, either by means of full-sized boats or by means of models.
3. Most favorable dimensions of boats on rivers and canals, from the economic point of view.
4. Study of the operating of navigable highways and of the mechanical traction of boats, considered in regard to economics, technics and regulations.
5. Principles to be observed in laying out the system of navigable highways for a given country. Conditions of homogeneity for the system. Draughts of water. Carrying capacity of boats. Profiles of canals. Locks. Standard shape for bridges and tunnels.
6. Formulary of characteristic data for a river from the double standpoint of its regimen and the needs of its navigation.
7. Determining and fixing channels for navigation in rivers of variable depth and width of bottom.
8. Marking navigable channels in broad and shallow rivers.
9. Rapids and waterfalls of rivers. Methods of regulating.

10. Changes and improvements made in movable dams. Arrangements adopted for turning their lift to account in the production of energy.
11. Operating of locks.
12. Mixed canals. Study of the conditions to be fulfilled in the construction of canals complying with the modern demands of inland navigation and able to be used for the production of power and for irrigation.
13. Steps taken of recent years to reduce the length of suspensions of operations and to obviate interruptions to navigation.
14. Lighting inland navigable highways at night.
15. Loading and discharging boats.
16. Mode of construction suitable for reservoirs and arrangements of the equipment to be used in operating them.
17. Data regarding systems suited to overcoming high lifts between the levels of canals.
18. Increase of the discharge of rivers during low water by means other than the storage of surface water (tightening the bed, cut offs, borrowing subterraneous waters, etc.).
19. Yards for construction and repair of inland boats.
20. Comparison of unit costs of transportation : 1° by rail and inland navigable highways; 2° by lake and by sea.
21. Regimen of the rights-of-way (1) of navigable highways.

(1) In French *francs-bords* : it is the space 10 metres wide on each of a canal or other waterway.

22. Bringing statistics of inland navigation to the same form. Comparison of the statistics of different countries.
23. Comparative legislation regarding inland navigation in various countries, especial consideration being given to the division of the first cost between the State, Corporate Bodies and private parties interested.
24. Institutions for social foresight, protection and instruction for persons belonging to the boating industry. Development of mutual insurance societies and of other cooperative associations.

2^d Section Ocean Navigation

25. Apparatus for recording the level of the water. Tide gauges.
26. Determination of the power of waves breaking against unfinished maritime works.
27. Improvements made in the experimental methods for determining the resistance of ships.
28. Unification of the systems of gauging vessels.
29. Statement of the experiments to be made to determine the position of the channels for navigation to be opened in the estuary of rivers having a movable bottom and emptying into a tideless sea. Means applied successfully for obtaining and maintaining these channels (lines, dredging, dykes, spur-dykes, etc.). Most advantageous cross sections.
30. Arrangements of outside works for the defence of sea ports; width and orientation of the mouth with special regard to prevailing winds and to possible deposits.

31. Comparative economical study of ladder dredges with internal combustion motors, and with steam motors.
32. Limit of the velocity of currents in maritime canals and in the channels leading into ports. Velocities due to tidal oscillations at the entrances to maritime canals.
33. Economical and technical study of the floors of lock chambers, of head and tail bays of maritime locks.
34. Latest constructions of lighthouses and of illuminating apparatus.
35. Latest methods for marking channels.
36. Improvements in fog signals.
37. Means employed to insure, develop or facilitate commercial operations in sea ports under a given economic system.
38. Equipment and apparatus used for raising sunken ships or boats and for saving cargoes. Public or private organisation of the equipment. Creation of powerful organisms at determined points.
39. Free ports and installations not under customs control. Legislation and economic results.
40. Discussion of the relative areas of the various parts of sea ports.
41. Efficiency of quay walls in regard to their equipment for loading, discharging and storing freight.
42. Technical and economical results of operating large existing canals.
43. Measures taken by Governments to protect ocean navigation and the construction of ships.

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