

The GULF STREAM



Map of Gulf Stream and Other Atlantic Currents.

(Prepared by the National Geographic Society, Washington, D. C.)

It is a seeming paradox that the world's greatest, and in many ways most important, "river" has no banks. But the paradox disappears when the Gulf stream is introduced as this mightiest of terrestrial "rivers." Though it has no banks throughout most of its course, its margins are fairly well defined for many hundreds of miles; and even where it skirts the Grand Banks of Newfoundland, nearly 2,000 miles from what is generally thought of as its "source," its edges can be distinguished almost sharply when crossed by a change in the color of the waters.

That the Gulf stream deserves to rank as perhaps the greatest of streams can be seen from the staggering volume of water which it carries at a fairly rapid rate. In fact, some who have studied it and other ocean currents closely have called it "probably the grandest and most mighty of terrestrial phenomena." A calculation of the average volume of water passing through the 40-mile-wide Straits of Florida—where the Gulf stream comes nearest to having "banks"—gives the enormous sum of 90,000,000,000 tons each hour. If this one single hour's flow of water could be evaporated, the remaining salts would make several cargoes for all the ships of the world.

Even this tells but part of the story, for the Gulf stream does not come solely from the Gulf of Mexico. One branch flows northward outside the West Indies and joins the Gulf of Mexico branch north of the Bahamas. The main Gulf stream, then, as it flows along the coast of the Southern states above Florida, probably moves as much as 180,000,000,000 tons of water an hour—a flow that utterly dwarfs that of all the world's Amazons and Congos and Mississippi.

The Gulf stream has had a role in world affairs, the importance of which is seldom realized. For ages it has helped in the scattering and evolution of animal and vegetable forms. It has held the climate of much of northern Europe in its moving waters. But for its beneficent work as carrier of equatorial heat to the northward and eastward England might have the climate of Labrador, and Norway the bleakness of Greenland. It has even had much to do with the geological formation of large areas of the ocean's bottom by determining the places of sedimentation. And day by day it is a factor in the price of everything carried afloat between Europe and America, as well as in the safety of all who cross the Atlantic.

Helped to Shape History. The great current has had its part, too, in shaping the history of America. Before the discovery of the New World, strange woods and fruits were found on the shores of Europe and the off-lying islands. Some of these were seen and examined by Columbus, and to his thoughtful mind they were convincing evidence that strange lands existed somewhere to the westward. These objects were carried by the Gulf stream and by the prevailing winds from the American continent, so that in part the stream laid the foundation for Columbus' famous voyage. Once under way, and sailing across the southern rather than the northern portion of the Atlantic, Columbus had the return flow of the great circular stream to help carry him to the West Indies.

Ponce de Leon, famous searcher for the Fountain of Youth, discovered the Gulf stream at the point where, constricted between Florida and the Bahamas, it flows most mightily. He tells in his journal how, in attempting to sail southward along the Florida coast, with a good wind behind, his ships steadily lost ground because of a mighty current flowing northward.

The division of the English colonies into New England and Virginia was probably in part due to the routes by which they were reached. Vessels bound from England to New England crossed the North Atlantic outside the limit of the Gulf stream, or in a feeble adverse current. They had the advantage, too, of crossing the Newfoundland banks and of being able surely to replenish their provisions by fishing.

This voyage, however, though advantageous to the New Englanders, situated in the North, was not considered practicable for vessels bound for the Southern colonies. They sailed south to the trade-wind region, through the Caribbean and around Cuba, thence following the Gulf stream to their port. The first seamen to become fairly familiar with the limits of the Gulf stream between Europe and America

were the New England whalers, who found their quarry only outside the current's warm waters. Benjamin Franklin heard of their experiences, and also how the coasting vessels from Boston to Charleston, S. C., sometimes would take three or four weeks to make the southward voyage, but would often accomplish the return trip in a week. He found, too, that English packets with American mails were two or three weeks longer on the voyage to America than in the reverse direction.

Named by Franklin.

Franklin suggested the name, "Gulf stream," because it issues from the Gulf of Mexico. Although it is only a part of the grand scheme of Atlantic ocean circulation, and though the Gulf of Mexico is in reality only a sort of way station for this part, the name is generally applied to the current as it was given by Franklin.

In the large funnel-shaped opening between Cuba and the western extremity of the Florida reefs the current is somewhat erratic, but by the time Havana is reached it has become a regular and steady flow. As it rounds the curve of the Florida shore the straits contract and the current then practically fills the banks from shore to shore and reaches almost to the bottom, which at this point has a greatest depth of nearly 3,000 feet.

As it leaves the Straits of Florida its direction is about north, but it gradually changes and follows a course approximately parallel to the curve of 100 fathoms depth until it arrives off Cape Hatteras, and maintains about the same width as when it issued from the Straits of Florida. From this point it starts on its course to Europe. It has lost something in velocity, as well as temperature, and as it journeys to the eastward it gradually diminishes in both, until at last it becomes a gentle flow.

On this part of its course it passes not far from the Grand Banks of Newfoundland, where it is met almost at right angles by the great Labrador current, bringing down from the Arctic a stream of cold water, pack ice and icebergs. This floating ice, dumped into the Gulf stream, was the cause, not many years ago, of the appalling Titanic disaster.

When this cold current meets that of the Gulf stream, of much higher temperature, the former undercuts the latter. The shallow-draft pack ice, being no longer under the influence of the polar current, is carried to the eastward by the warm Gulf stream current and soon disappears, but the deep-draft bergs are still under the influence of the lower current running south, as well as of the surface current running east, and so they continue on until well into the Gulf stream, sometimes reaching the thirty-ninth parallel, which is nearly 200 miles south of the southernmost point of the Grand Banks.

This ice, together with the fog which usually accompanies the meeting of currents of considerable differences in temperature, has compelled steamship companies to make a detour around the region of danger. Congress early recognized the importance of learning everything possible about the Gulf stream and authorized the coast survey to make observations. In the Straits of Florida it was found that the greatest surface velocity was about four miles an hour and that this maximum was reached about eleven miles from the Florida shore. Even at 250 fathoms, or 1,500 feet, below the surface the great stream was found to be moving along at about a mile an hour. At this point the stream is about forty miles wide.

Explained by Scientists.

Numerous theories have been advanced to account for the Gulf stream and other ocean currents. But the many observations of the coast survey and the studies of the late Admiral John Elliott Pillsbury of the navy have about settled the matter in favor of wind and wave. The trade winds are the real parents of the Gulf stream. Though they vary somewhat in exact direction and in velocity, they blow steadily, on the average, in the same general direction in the west, year in and year out. Their friction induces a current in the water in the same direction. At first—if one can imagine the beginning of the Gulf stream's flow—only the merest surface skim was driven along with the wind. But gradually the motion was communicated from layer to layer until at last the movement extended to water hundreds of feet below the surface.



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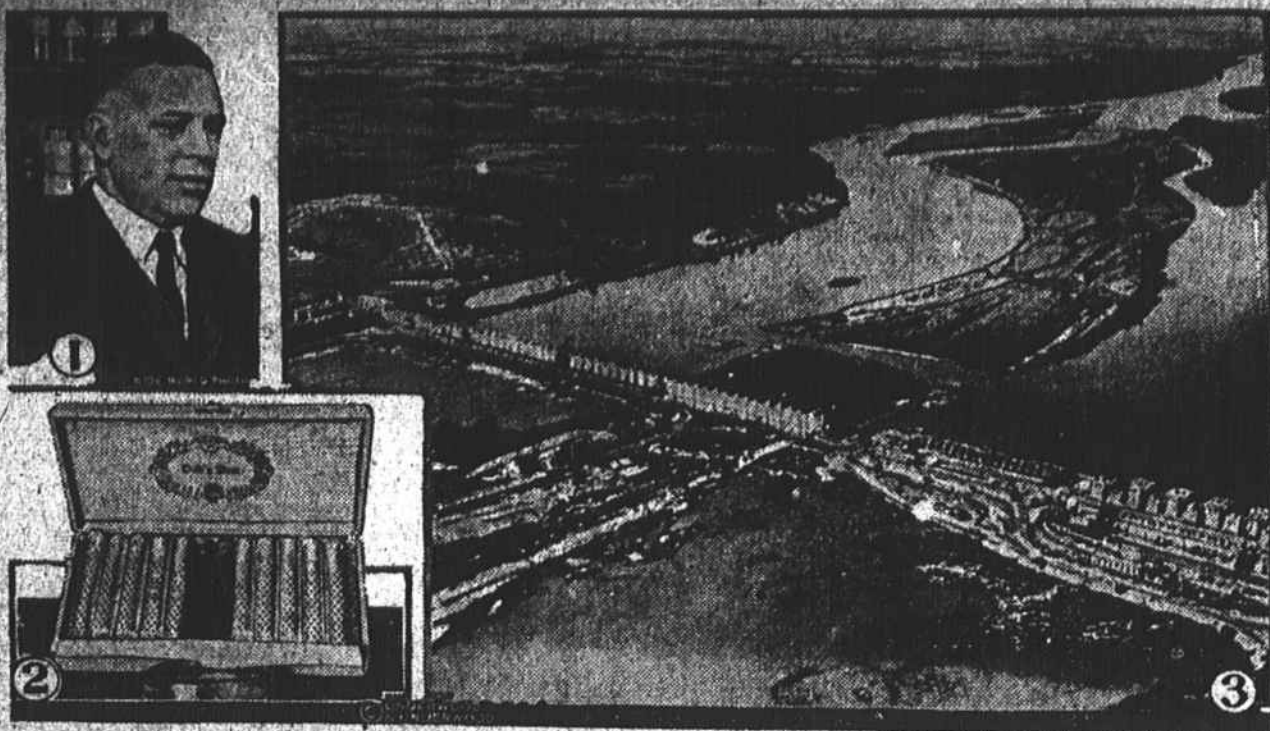
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NEWS REVIEW OF CURRENT EVENTS

Daugherty's Resignation Is Expected, Following New Corruption Charges.

By EDWARD W. PICKARD
IF HARRY DAUGHERTY is still attorney general of the United States when this reaches the reader the expert prognosticators in Washington are badly at fault. Last Thursday they predicted his resignation from the cabinet would be in the hands of the President by the end of the week, and that it would take effect on Monday, the day when Secretary of the Navy Denby was to step out of office. Mr. Daugherty went to Florida for a stay of two weeks, but was summoned back to Washington, arriving Friday. Already the President had changed his mind about asking the attorney general to retire, according to reports, and was considering his successor. Those said to have been approached included Senator Borah of Idaho, Judge William S. Kenyon of the Federal Court of Appeals, Federal Judge Frank S. Dietrich of Idaho and Curtis D. Wilbur, a Supreme court judge of California.

President Coolidge's change of mind presumably was brought about partly by the sensational revelations of official corruption to the federal grand jury in Chicago that indicted Charles R. Forbes, former director of the veterans bureau. These were not related to the Forbes case, so the information was carried to Washington by a special prosecutor. Some of it seriously involves the Department of Justice, relating to procurement of pardons for federal prisoners. This is only a part of the matters that will be investigated by the senate committee named to handle the charges against Daugherty. The committee is made up of Senators Brookhart of Iowa, chairman; Moses of New Hampshire; Jones of Washington; Ashurst of Arizona and Wheeler of Montana.

This Department of Justice evidence was not the most sensational carried to Washington from Chicago, however. Charges of wholesale corruption and graft during the Harding administration were made against certain persons known as "the Ohio crowd," and two members of the house of representatives, as yet not publicly named, are directly accused of having collected between \$150,000 and \$200,000 in two or three years from federal prisoners and their friends as payment for pardons, paroles, commutations and other forms of clemency. If the charges are substantiated, these congressmen face expulsion from the house and also indictment for a penal offense. As soon as Special Prosecutor Crim reported in Washington, President Coolidge directed the Department of Justice to take immediate steps toward the prosecution of the two representatives. The house was asked to investigate the matter by Representative Garrett of Tennessee.

Whether officials of the Department of Justice were in collusion with the members of congress who received payments for dispensation of clemency is not clear. One official, closely identified with the Harding administration who was active in obtaining clemency in cases in which the members of congress were interested, is said to have been their dupe.

THOSE telegrams that passed between Washington and E. B. McLean in Florida and the persons that handled them occupied much time of the senate oil lease committee last week. A code expert of the army signal corps translated the messages that were in cipher and Mrs. Duckstein, an operative of the bureau of investigation in the Department of Justice, admitted sending the telegram warning McLean that the committee was on his trail. She said the code she used was obsolete. William J. Burns, chief of the bureau, testified that McLean was a "dollar-a-year" operative and that the message was sent to him in the hope that he would resign that position. More interesting was this telegram sent to McLean by Ira Bennett, editorial writer on the Washington

Post: "Saw principal. Delivered message. He says greatly appreciates and sends regards to you and Mrs. McLean. There will be no rocking of boat and no resignations. He expects reaction from unwarranted political attacks."

Senator Hefflin of Alabama read this to the senate and ventured the opinion that "principal" meant President Coolidge. He therefore asked that the committee call on Mr. Bennett to explain just what the message meant and who it was that he saw. Senator Caraway also talked about that message and told the senate: "I'd like the President to say whether or not he entered into communication with McLean in Florida. One hundred million people would like to know." Some of his allusions to Mr. Coolidge were undignified and in wretched taste.

Caraway's question was answered Thursday when two telegrams from President Coolidge to McLean were read to the committee. They sounded innocuous and Mr. Coolidge explained in a statement that the first related to the district commissionership and the second was in regard to a message from McLean congratulating the President on his statement concerning the demand for Denby's resignation.

The President nominated Samuel Knight of San Francisco as special counsel to take charge of the government's suit to oust the Standard Oil company from naval reserve No. 1 in California. Senator Walsh told the senate committee that he had learned Mr. Knight had acted as attorney for the Equitable Trust company of California, a Rockefeller institution, and indicated that for this reason he would oppose his confirmation.

REPRESENTATIVE LONG-SETTLE'S compromise tax bill setting the maximum surtax rate at 8 3/4 per cent won in the house, the insurgent Republicans falling in line. But what the senate will do with the measure is a question. President Coolidge let it be known that he still wants the Mellon bill passed and it is believed the senate finance committee might be persuaded to report it as a substitute for the measure passed by the house. But Senators Watson and Moses have informed the President that the 25 per cent surtax would not be approved on the floor of the senate and that the figure probably would be boosted to 37 1/2 per cent, or perhaps as high as 40 per cent.

THERE appeared in the house last week a strong sentiment in favor of a soldiers' bonus bill providing for a cash bonus or issuance of an endowment insurance policy, at the option of the beneficiary. The ways and means committee completed the hearings on bonus legislation, during which charges were made that concerns with which Secretary Mellon and Secretary Weeks are connected have been contributing funds to the anti-bonus campaign. Senator Caraway already had written Secretary Mellon about that story, and the latter replied that he has never authorized or co-operated with any person "in raising any fund whatever that had for its purpose any propaganda" against the bonus measure, nor any other measure that has been before congress during the time that Mr. Mellon has occupied his present office.

SENATOR HIRAM JOHNSON issued a statement early in the week to the effect that the Coolidge campaign managers knew they were beaten in all direct primary states where the voters have a free voice in the selection of delegates and that, consequently, they were resorting to petty tricks to defeat the Johnson candidacy. On Tuesday the Republicans of Iowa met in convention, chose their 29 delegates to the national convention and instructed them for Coolidge. On Wednesday the Republican county conventions of Minnesota were held and in a majority of them Coolidge was endorsed for the nomination, making it virtually certain that the state's delegation at Cleveland will be instructed for him. The lack of opposition to Coolidge from radical sources in these two states, and the withdrawal of LaFollette from the primary contests in several Northwestern states, were looked upon by some politicians as indications of the probable formation of a third party. LaFollette says

his refusal to be a candidate for the Republican nomination is due to his feeling that his present duty lies in the senate, and also to his certainty that in the Cleveland convention "the steam-roller will be operated by the same forces that controlled it in 1912 and other years."

Mr. McAdoo replied to Senator Reed's attack on him with a letter in which he fiercely denounced the senator, setting forth the Missouri's rather unenviable political record and asserting that Reed had resorted to "the most glaring disregard for the truth" because McAdoo would not stay out of the Missouri primary contest.

FIFTY-EIGHT members of the house of representatives—35 Democrats, 22 Republicans, and 1 Socialist (Burger)—have united in an effort to have the Volstead law so amended as to permit the manufacture and sale of beer, wines and cider containing not to exceed 2.75 per cent alcohol. They introduced a bill to that effect.

ARCHBISHOPS PATRICK J. HAYES of New York and George W. Mundelein of Chicago sailed for Rome on Saturday, having been summoned suddenly to the Vatican, and it was announced that they would be elevated to the cardinalate at a consistory to be held March 24. They will be the first native-born Americans to hold such high office in the Roman Catholic church.

THE Filipino independence mission, which has been active in Washington for some time, was dealt a sad blow last week by a letter from President Coolidge to Manuel Roxas, head of the group of natives. The President covered every angle of the controversy and declared flatly that he did not think the islanders were yet ready for independence. He based his opinion on the danger to the Filipino people of economic or political disorders, perhaps even amounting to disaster, in event of withdrawal of American support and protection; on the inability of the Filipino people at present to maintain the financial burden that would be imposed by political independence, and on the lack of political capacity necessary to the people of a minor nation assuming the full responsibility of maintaining itself in the family of nations.

The President asserted the complaints against General Wood were unjustified and that the governor general was "a hard-working, painstaking and conscientious administrator."

ALL who deserted from the army or navy between Armistice day, November 11, 1918, and the formal ending of the World war have been granted amnesty and restoration of citizenship by the President, who followed the advice of Secretaries Weeks and Denby in the matter. This does not include Grover Cleveland Bergdoll.

ACCEPTING the statement of the German government that practically all the treaty requirements concerning disarmament and demobilization have been carried out, the allied council of ambassadors has decided that allied military control of Germany shall be abandoned and a modified system of supervision of German armaments substituted. This is in accordance with the suggestion of Prime Minister MacDonald.

March 15 is now given as the date for the submission of the report of the Daves committee of experts. It is said the committee will propose that Germany continue its deliveries of materials for reparations, but that it will not be asked to make any cash payments for five years. Of course it would have to pay the German industrialists for the materials delivered to the allies.

SAN JOSE, the capital of Costa Rica, was half destroyed by the severest earthquake that country has had in 25 years. The American legation was badly damaged, but the minister and his family escaped injury.

THE Turkish national assembly has abolished the caliphate and deposed the caliph, Abdul Medjid Effendi, who left Constantinople for Switzerland. For the present the Mohammedan church is without a supreme head.