E. O. Hovey
Guadeloupe
1915
(St. Vincent) "Clissett" voyage 1915
Guadeloupe - pp.1-54.

Arctic Voyage of the "Chlett" beyond Guadeloupe pages.

1. Map of Lesser Antilles showing route followed.
2. Map of Grande Terre w. route
Heilprin Exploration Fund
Expedition of 1915
(Inaudomaga)
The Heilprin Exploration Fund was established in 1914 by relatives of the noted explorer and geographer, the late An- gelo Heilprin of Philadelphia, for the purpose of aiding geographical work under the aus-
fices of the American Mu-
seum of Natural History. In
account of Professor Heilprin's well-known work on the 1902-
1903 eruptions of Mt. Pelee, Mar-
tinique, it was considered
particularly appropriate that
the first work under the fund
should concern the active
volcanoes of the Lesser Antilles, in continuation of the work already done for the American Museum in 1902, 1903 and 1908, through expeditions led by the present writer. The object of a new visit was to make a comparison of conditions past and present, in connection with preparing a critical study of all previous observations on the eruptions.

Leaving New York by the "Griance" of the Quebec Steamship Company line on 5 February, the city of Pointe à Pitre, Guadeloupe, was reached on the 14th, and arrangements were made at once for making cross sections of the lava.
of the double island which forms the French colony of Guadeloupe. All Guadeloupe has an area of 1,000 square miles, of which 500 lie in the higher section known as Basse Terre and 500 in the lower portion called Grande Terre. Basse Terre is volcanic in origin and has mountains rising nearly 5,000 feet above sea level, while Grande Terre is wholly sedimentary, superficial in character and is low in relief. None of its undulating surface being more than 200 (50?) feet in elevation. Between the two portions of Guadeloupe there is a belt of mangrove swamp varying from one mile to three
miles in width, through which
arrows the tidal river called the
"Rivière Salée." A fine highway
forty miles long
connected Pointe à Pitre, the
commercial center, with Basse
Terre, the political capital. This
road crosses the swamps on an
earth causeway and the Rivière
Salée by a pontoon drawbridge.

The Rivière Salée, with its
bordering swamps, is really
an arm of the sea, but it
receives much fresh water from
permanent
several rivers which drain
the eastern slopes of the moun-
tains of Basse Terre. Grande
Terre on the contrary suffers
great discharge
present practically no sur-
face drainage into the swamp.
except two intermittently
during the rainy season.
Under the influence of the
strong S. S. E. east
tradewinds, a feeble current
sets northward through the
Rivière Salée. The current is
reversed when the wind veers
to the east northeast.

At 5 o'clock of the morning
of the 16th, Thursday, M. St. Sainte
Croix de la Roncière, one of the
most prominent of the French
men of the colony, and I started
from Pointe à Pité for Porte
d'Enfer, with Mr. Gaudry as
chauffeur. Porte d'Enfer lies
on the northeast coast of Grande
Terre, and our course to it
led through Port Louis, where he stopped at 7:30 o'clock for breakfast with M. Robert Castaigue, local manager of the great sugar and rum mill there, and his wife. The capacity of the mill is 10,000 metric tons of centrifugal sugar and 6,000 barrels of rum. Much automatic machinery is in use in this mill. After breakfast, we took M. Castaigue with us in our motor and drove on three or four miles to Belle Vue, the outermost of the estates belonging to the company owning the Port Louis Mill. M. Castaigue had two carriages.
awaiting us there and after a short delay to watch the loading of the sugar cane on to the cars of the estate some railway which collects cane for the mill and ends at Belle Vue, we set out on the remaining part of our journey.

From Pointe à Pitre to Belle Vue the road traverses a rather flat country, much of which is devoted to the cultivation of the sugar cane, though great areas are still in a wild state. Toward Port Louis and on to Belle Vue, the acreage in cane predominates.

Our three mile drive northward northeastward from Belle Vue lay through an abandoned estate whose land now lies fallow and then plunged us into the mangrove tangle
The valley is bordered by a narrow, forested bank. This bank is marked by a small waterfall, which is a perfect place for resting and observing the water flow. The valley is wide and shallow, with a gentle slope leading down to the river. The river itself is calm, with only a few small rapids creating small waves. The surrounding trees are dense, providing a cool and shaded environment. This is a perfect place for a picnic or a quiet walk through nature.
continued beyond Porte d'Enfer to Grande Vigie as a bold sea cliff. At the Porte the face seems to trend about N 25° E (mag), to grade about 70° from the vertical toward the SSW, and to show an uplift of 80 to 100 feet on the western side of the line of zone of fracture.

At the head of the cove there is a broad coral beach about 30 feet (9.1 meters) long on which the ancient Canibs used to land their boats on their return from the fishing grounds, before the supremacy of the white man was attained. This landing must have been a somewhat dangerous operation on account of the surf which beats constantly on the cliff and today. On the day I may visit formed a barrier across the mouth of the harbor which
years ago the top of the arch
broke down claiming a
few of the cliff ledges. Some
times the sea would rush for the entrance and
rifle the door of the house. The entrance
door has been carried
away by the sea and
the arch is now only a
wide, broken down door
Le Conte di Sefiora
was named San
Pietro. It was called
San Pietro because of
the arch which is
named after the
diocese of
Siena. San
Pietro is
called after the
county of
Siena.
a heavy storm, leaving a detached pillar to guard the core. The Grande Vigie, at the extreme northern point of Grande Terre, is a similar detached column standing out from the mainland. The process of forming making such an arch is illustrated in a little core two hundred yards east of the Port, where the sea has excavated and is enlarging a pretty little grotto. The work is aided by the jointing of the limestone.

In this region the upper 60 or 70 feet of the limestone composed of an agglomerate composed of large masses of Meandrina and other corals.
cemented together by indurated lime sand originating from corals and other marine animals and algae. The lower exposed portion of the cliffs consists of more finely comminuted material and masses of coral seem to be absent, or at any rate rare. This finer bed is at sea level and is greenish black in color from its coating of plant growth whose growth is fostered by the constant wetting by tide and waves. The whole surface of the limestone rock has been deeply corroded where even the sea can reach it by wave or spray. The result is an intricate network of cirque-like hollows
and long or short, narrow channels. The crests left between these depressions are sharp and tend to come to walk over. The character of this surface is shown indicated in photos 21, 28 A & 30 A. The upper surface of the cliffs is barren of vegetation for fifty to one hundred and fifteen yards back from their edge, where the Leany surf casts its spray. The photographs give but a suggestion of force exerted by the Leany surf.

Looking southeastward from the point at Port d'Enfer at the base of the cliffs horizontal one sees a narrow shelf of rock at 4 feet above sea level. This shelf is still wave-swept but it suggests a comparison
tively recent elevation of Grande Terre.

Another day was devoted to examining a section farther east across the island. Our route led eastward from Pointe à Pitre to Ste Anne, thence northward to La Moule on the northeast coast and returning by way of St. Francois on the southern coast. The traverses were over a slightly rolling country, somewhat cavined along the south shore, where hills 60 to 100 feet high were observed. The rock exposed in the road cuttings is all a soft limestone, occasionally agglomeratic in character, containing from numerous rock sets that yield Tertiary invertebrat
fossils. The beds show a gentle dip of about 10° toward the west-northwest. The soil is fertile and much sugar cane is raised except near (within two or three miles?) the northeastern coast, where there is too much salt in the atmosphere, on account of the strong trade winds blowing off from the ocean, and the rainfall is very low.

The town of Le Moule has the only good harbor on the windward coast of Grande Terre, but its use is curtailed by the damage due to the breaking of heavy surf on the coral reefs near its entrance. The cliffs characterizing the Porte d'Enfer region are
lacking here and the shore slopes gently to the sea. The surface rocks are like the upper beds at Porte d’Enfer, a coarse agglomerate containing large and small masses of the and other corals cemented to-gether by calcareous meal. The region in fact, devoted to agriculture and cane growing.

The illustration shows the sharp-pointed forms resulting from the corrosion of the limestone by the waves and spray. There are dangerous coral reefs off Le Moule and the harbor can be entered only under favorable conditions of wind and surf. A red flag flying on the old re-doubt indicates that the harbor is impracticable.
A third day was devoted to visiting the Pointe des Chateaux, the eastern extremity of the island, which is at the end of a peninsula 15 miles long stretching out into the Atlantic Ocean toward the small island of Desirade, from which it is separated by a strait 20 miles wide. Desirade and Marie Galante, lying 60 miles to the south, are described as being composed of limestone that is like that forming Prande-Terre. The Pointe des Chateaux is a rugged cliff rising vertically on the south, more gently on the north, to the height of about 70 feet above mean sea level. Like
Porte d'Enfer is composed of a heavy bed of brain-coral agglomerate, lying upon a grayish or yellowish green calcareous sand-rock. The sand-rock is exposed for about ten feet above sea-level, is free from the large masses of which characterising the upper bed of coral and has been much blackened by the action of the seawater. There is no apparent discordancy between the sand-rock and the overlying agglomerate. The strike of the beds is about N. 30° E. and the dip 10° or 12° toward the W.N.W. Near the sea the surface of the rocks, when nearly horizontal, is roughly corroded as at Le Moule and the Porte d'Enfer. The
cape behind the Pointe des Châteaux is low and largely
brush covered with thickets. Rainfree is scant.

If the sea-grape. Near the
northeastern shore there are
several "salt pans" where for-
merly salt was prepared
commercially from the
seawater. Wild goats and sheep
abound. The elephant tooth from Grade-
loupè which was described by
X and on which much
speculation has been based
regarding the former connec-
tion of the Lesser Antilles with
continental America is stated
by La Roncière and X to
be unsatisfactory. They say that
the tooth was brought to the island
by travelers. X alone and with
its doubtful history it seems! 20
weak evidence for an old land
connection with South America,
as compared with the strong
contrary evidence presented by
the islands themselves in
their nature and in the certainty
of their comparatively recent eleva-
tion through some hundreds of feet.
This recent elevation of the chain
of islands is indicated by the
elevated sea beaches, sea
potholes and beach lines that
occur in a constantly
rising series from Grenada
to St. Eustatius (100? ft
on Grenada, 1500? ft on St. Eus-
statius). Guadeloupe Lascies
some 900 feet in this recent
emergence. There is no evidence
The principal object in stopping in Guadeloupe was to visit again the Grande Souffrière and its fumaroles, to compare the condition of the latter with the observations made in 1903 and 1908. Hence, M. de La Pancière and I left Pointe à Pitre at 6 o'clock of the morning of 19 February by the autobus which carries the mail daily to the town of Basse Terre, forty miles distant by road from the Caribbean side of the high island of the same name. The cobble-stone highway crosses the Rivière Sales on a pontoon drawbridge [see p. 4] Basse Terre island as far as known is entirely volcanic in origin.
and area?) It consists of a series of dead volcanoes, the principal of which from south to north are Vieux Fort, Grande Citère, L’Échelle, Grande Soufrière, Nez Cassé, Deux Mammelles (make list complete + include altitudes). Warm springs are reported from several as east issuing at several localities, but the geography of the high mountainous district is but little known. The present distinctly volcanic activity of the island is confined to the Grande Soufrière and its neighboring mountain L’Échelle.
The colonial highway, after crossing the Rivière Salée and its bordering lowlands, turns abruptly southward and skirts the coast as far as Trois Rivières. Then it begins to ascend the high ridge connecting the Vieux Fort mountains with the main back bone of the island. It crosses many flood ash deposits or slopes of debris which have been brought down from the mountains by stream and flood action.

The eastern slopes of the high mountains face the trade winds and receive much more moisture and rain than the western. Therefore streams are more numerous, copious and permanent, the slopes more gradual and
the western slope of the mountains receives much less moisture and rain than the eastern. They are much steeper than the eastern, the valleys are more profound, the lowlands are narrower or lacking entirely.

West of Trinis Rivières the road rises rapidly to gain the top of the high ridge or col connecting the mountains of Vieux Fort with the main mountain range of the island. On this ridge there is an area of lava blocks and other debris apparently issued from the Soufrière and which
is supposed by some to be the ash-flow of the eruption seen by Columbus when he discovered Guadeloupe. [N. B. La Roncière says that this is described or mentioned in the son's life of the admiral.] The bed looks as if it might be assigned to an outburst as recent as that would be. It is reported that there are extinct fumaroles surrounded by sulphur deposits in the top of the massif of Vieux Fort. De La Roncière stated to me that he had visited them. The old fort south of the city of Basse Terre rests upon a ridge of ash agglomerate which betokens an ancient
eruption of the Grande Soufrière. Many similar
records of old eruptions are to be found along the coast as well as in the interior of the island. Al-
though there are many solid-beds of solid lava exposed, and domes of lava appear in the moun-
tains - as in the Cone of the Grande Soufrière - it seems probable that the major portion of the land mass is composed of fragmental ejecta. If the Grande Soufrière can be taken as a fair
sample of the volcanoes of the island, andesite (what kind?)
predominates among the lavas and explosive eruptions have been the more common
type of outburst from the vents.
Arriving at the town of Basse Terre at the usual hour of 10 o'clock we were met at the autobus garage by Mr. Hubert Ancelin and taken to his home for an elaborate breakfast. After this, we drove out northward from town to the place where there is still in operation a rum distillery established by the famous missionary of the eighteenth century, Père Labat. This Jesuit father made a profound study of the Caribs and as well as of the negro and French population of the French West Indies and instituted many projects for the betterment of the condition of the laboring classes. Here (where?)
he had a large monastery (or
the ruins of which still stand
near the old rummery.
In its garden were carried on experiments in agricul-
ture and gardening as well as horticulture. One of the products was a delicious white, slip-shin grape similar to the Niagara grape of western New York state. Pissards infest-
ed the Caribbean Sea in Pére Labat’s time, hence the good missionary had to erect a tower of defense near his monastery and distillery for their protection. The old Bistron’s fields estate lay upon an low angled volcanic slope of ash coming down
from the Grande Soufrière. [29 miles La Roncière and I were planning to spend at least two nights on the summit of the Grande Soufrière, hence we secured hammocks and supplies from Anselin and set out by carriage late in the afternoon for Saint Claude where we were to spend the night on our way to the mountain. Saint Claude is healthfully situated about 1500 feet above the sea and is the home of many men doing business in Hot Basse Terre. Contiguous to it is the former military establishment of Camp Jacob in which are the governor's residence and an excellent
hospital. Hotel accommodations in St. Claude are limited to the excellent little inn which has been kept for years by three sisters of St. Joseph who took up this means of making a livelihood, when their monastery was secularized by the national government. Kinder or more thoughtful hosts could not be found than these ladies prove themselves to the travelers who seek shelter beneath their roof.

Early in the morning of 20 February I left the hospital and called for de la Roncière at the home of the friend with whom he had spent the night in a former officer's house.
in Camp Jacob. Our two (31
reporters were on hand for
their service and at ten o'clock
we reached Baing James.
This is a favorite place of resort
1500 feet above St. Claude or
3000 feet above the sea, where
a warm spring gushes from the
mountain side in the midst
of the dense tropical forest.
A pool some fifty by fifteen
feet in area and about five
feet deep as the maximum
has been walled formed by
a wall. The water is only tepid
now and de La Rocheiure says
that its temperature has de-
creased noticeably within the
last ten years. Without having
actual figures at hand, his
Statement seemed to me to be correct, as I recalled the bath as it was in 1908. The Club des Montagnards of Guadeloupe maintains a rest and bath house beside the pool for the convenience of its members and guests.

My friend and I rested for a few minutes near the pool, enjoying the view over the southwestern portion of the island and the Caribbean sea which is to be obtained from a clearing in the woods which was once occupied by a dwelling house and its garden. Then we passed on through the diminishing forest and at its upper limit stepped
aside at an angle of the trail to get the magnificent view from commanded by an outlook shelter overlooking the gorge of the Matyliis, the bowl-shaped crater of La Grande Citerne and in the distance the maze of peaks comprising Vieux Fort. From this point the trail ascends rapidly through low bushes to the open slope at 500 feet above Bars James which is thickly covered with wild pineapple and luxuriant moss. Flowers are abundant here, among which we noticed with particular pleasure a pretty little white orchid of terrestrial habit.
of the cone at about 3800 feet above the sea, where begins the thousand foot steep climb to the summit plateau of the volcano. The side of the cone is steep, averaging from 40° to 45°, and the ascent is a veritable climb, which it is advisable to take early in the morning to avoid the fierce rays of the tropical sun. The whole cone is thickly covered with long moss, the masses of which are beautiful as this season of the year, with their shades of light yellowish green, greenish yellow and flesh pink.

At about noon M. de La Roncière and I reached the hut built by the Club des Montagnes.
yards, which was erected with much labor in 1904 (?) and stands in a sheltered spot near the pinnacles of rock which form the Porte d’Enfer (21.46.A). The hut is a simple affair of one room containing a table in the middle and a bench around three sides, but it is a welcome shelter from the rain which often falls on the mountain and from the keen wind which sweeps over the summit and chills one to the bone in the pervading dampness. We spent two nights here on this occasion in comparative comfort, sleeping in hammocks swung from the roof timbers. Our negroes slept on the benches, but one of
there was much dis- 
turbed by noises which he at- 
tributed to "zombi" but which 
really were the whistling of the 
wind and the hissing of one 
of the strong furnaces. The 
man had never before been on 
the summit of the Soufrière 
and every strange sound ap- 
pealed strongly to his vivid 
imagination. He felt better when 
he had hung his blanket over the 
only window in the hut to pre- 
vent the zombi from coming 
in, though he had to sleep cold 
to pay for his precaution. For- 
tunately, fortunately, the doorway, 
which could not be closed, pro- 
vided ventilation during the 
night. The temperature went.
perhaps (50° F) during the night, though Le Boucher (reference) states that temperatures as low as 0°C (32° F) have been recorded on the top of this mountain.

The summit of the Soufrière is characterized by pinnacles and ridges rising from 50 to 150 feet above the general level of what is called the summit plateau. The most prominent of these as viewed from Bass, the west, are called the Piton du Nord and the Piton du Sud. (21, 45 A + 21, 44 A). The western trail pants the base of the latter and within 150 yards passes through the Porte d'Enfer (21, 46 A or B), which is the name given
to the great clefths between a 38
50 foot pinnacle and a ridge.
The topography of the summit
is so much like that of Mt.
Pelé of Martinique that the
similarity in origin of the
two cones, as brought out in
my descriptive articles in the
Caribbees in 1903 and 1904 (Ref)
seems to be fully established
and was emphasized in my
own mind by the present con-
dition of the summit of
Pelé as observed later in
this year's expedition. (Add
descriptions of other pinnacles and the great clefths,
particularly the Grande
Fente, from previous notes
and Le Bouehe's map).
As soon as M. de la Ponce had dispatched our luncheon after arrival at the Club's shelter we proceeded to the great fumaroles to take their temperatures, going first to the one called Cratère Napoléon. There are four important vents in the cone of the Grande Souffrière from which steam issues now or has issued within the last thirteen years. Four of these are associated with the Grande Fente - Lac de Souffrière, Cratère du Nord, which has three openings, Cratère du Sud and Cratère Lacroix - and one, the Cratère Napoléon, in the most important secondary fissure traversing the cone. The Lac de
Soufre is the largest and most important of the whole series but it is inaccessible. (Illustrated from 1903 photos)

It lies within the Grande Fente where that fissure cleaves the solid lava from top to bottom of the north side of the cone. One can stand beside the fissure and look down into the chamber some eight or ten feet in diameter which seems to contain the principal vent, if there be more than one outlet for the steam. This chamber is beautiful, with its complete lining of sulphur in crystals. Below this chamber is another smaller room in which one can see pendent stalactites.
of sulphur, but they are made by ascending vapors in
stead of descending solutions as in limestone grottoes. Le
Boucher (reference) gives the following account of the
old sulphur cave (translation from Le Boucher):

The opening leading into the chambers is said to have been
closed by a landslide which took place in 1843 at the time
of the great earthquake destroyed
the city of Pointe à Pitre and
shook the whole of Guadeloupe.
Apparantly this landslide
closed the lower end of the
Grande Fente, below the face
de Soufre, but it seemed to me
as I stood above the "lake" that
The old sulphur chambers were still existent and their entrance to them could be gained by means of a rope or a rope ladder. The rumbling within the chambers is strong and a large volume of steam issues from them, but no temperature observations could be made or gases collected.

To the senses there seemed to be somewhat less strength of discharge, no change in colour than at the times in 1903 and 1908.

The Cratère du Nord lies in the Grande Fente, \( \frac{2}{3} \) yards south of the Lac de Soufre. It now has three principal openings, which are arranged along a line running N50° W - S55° E.
The northernmost of these (43) is the most active, the steam issuing with force enough to throw out pebbles an inch in diameter when cast into the vent. Two temperature observations here one at six inches and the other at nine inches below the orifice gave the same results, viz. 99.5°C. (Corrected gas temperature.

The second vent, some ten or twelve south of the preceding, gave forth a gentle column of vapor and its temperature 18 inches below the bottom of its little crater was 95°C (212°F?)

The third vent, about ten feet further south, discharged so
little steam and this was so hot
and endured by the bare hand that
its temperature was not taken.

Proceeding southward there are no other fumaroles
in the Grande Fente until the
south side of the cone is reached.
There about 50 yards below the
top of the cone one finds the
Cratère du Sud. The actual
orifice of this fumarole is in
the bottom of the narrow open
fissure which the Fente here
present. It is wholly inaccessible
and is not very active.
Warm vapor rises gently from
the fissure and no hissing
noise could be heard. We
undertook to descend the depth
of the cliff with a stone tied
to a cord. The stone ceased descending when 43 feet of cord had been let out (Vid. Quad. Mt. Bk. No. 1 p. 24) Stones thrown into the open fissure where the vapor came out returned the noise of falling for seven seconds. Known in three yards distant on the same fissure could be heard for ten seconds. These experiments may indicate a depth of approxi-

Cratère Lacrouix, 300 feet below the top of the cone in the Grande Fente, is the most southern of the Grande Sou-
frière fumaroles. It was first observed in 1902 and received its name in honor of the famous
French geologist mineralogist whose masterly reports on the 1902-1903 eruption of Mt. Polé are well known to the scientific world. This vent has now ceased its activity. A small deposit of sulphur marks its location but no warm vapor now issues from it.

Next to the Lac de Soufrière, the Cratère Napoléon is the most important and interesting fumarole of Guadeloupe. The Grande Soufrière of Guadeloupe - this vent is in the southeastern quarter of the summit plateau of the cone and is associated with the long secondary fissure, which
Traverses the cone from S.S.E. (47°
to W.N.W. (cf. Le Bouyer's
map) making a gigantic
letter X with the Grande
Fente. The Cratère Napoléon
fumarole rises through a small
cone about three feet high and
twelve feet in diameter situated
in the northwestern quarter of
an oval, saucer-like depression
or crater about 100 feet across.
Apparantly, an explosion took
place here at some time (look
up eruption of 1857) and
the present fumarole is the resi-
due of the activity which caused
that explosion. Considerable
sulphur has been depos-
ited in and on the little
cone. Steam issues from
the vent with so much force that it supports a stone four inches in diameter thrown into the orifice and with so much noise that it could be heard distinctly at the Club's shelter a half-mile distant, when there is no wind. It was necessary to tie my thermometers to a stick to get the temperature here, which proved to be 99.5°C at a depth of 15 inches below the surface of the ground. This fumarole seems to be unaltered in condition from that of 1903 and 1908. What is presented in on the northern edge of the outer cone of the volcano, in line with Grande Fente, the
Fumaroles Colardeau first came into notice in 1902, after the eruptions on Martinique and St. Vincent began. These vent fumaroles never were vigorous enough to destroy much vegetation around their vents. Now a gentle column of steam indicates their position and their activity certainly has not increased since 1908.

South of the Grande Soufrière and separated from it by a conically shallow valley rise the older volcano known as L’Schelle, on the L’Schelle side of the saddle between the two mountains, in line with the Grande Fente, active fumaroles broke out in the late spring of 1902, or at any rate were first no-
ticed then. The vents rapidly increased in number until there were scores of them over an area several acres in extent at the base of the irregular cone or upper slope of L'Echelle and the steam arising from them was distinctly visible from Pointe à Pitre. The vegetation of the area was killed by the escaping gases and their heat, and much anxiety was felt by the inhabitants of the island lest the Grande Soufrière join in the devastating activity of Mt. Pelé and the Soufrière of St. Vincent. The area which was so active in 1902 still shows many active small vents scattered over it. These are from one to three inches or more in diameter. Most of these
are lined with a coating of cupro-nickelized and discharge into moist hot air. These were tested with the thermometer and gave a temperature of 95°C. One having almost no sulphur in it had a temperature of 96°C. During the past few years, the burn area has not increased perceptibly toward the east, but it has spread up the slope of L'Échelle where new vents have opened and boiling springs have developed. These seem to owe their origin to the damming of surface drainage from the mountain. The lowest of the springs is now five to six meters in diameter, almost circular in outline and is more than one and one-half meters...
deep. The principal boiling is in the eastern third of the Spring and the temperature of the water there is 94°C. In 1908 there was a much smaller boiling spring at this spot, but it was less active to crater contained no water in the dry season and its activity seemed less than it is now.

About six meters up the slope there is another similar spring about six meters long and three meters wide which was not in existence in 1908 and which is new even to M. de La Roncière's experience. Observation and he is a frequent visitor to the locality.

I should say on the whole that there has been no decided
change in the Grande Soufrière
fumaroles since my first visit
in February (2), 1903. The noticeably
lessened activity of the Fumaroles
Colardeau, Cratère du Sud and
Cratère La croix is counter-
balanced by the increased activ-
ity area occupied by the vents
on the slope of L'Échelle. The slight
diminution in the discharge at
Lac de Soufrière and Cratère
du Nord may be more apparent
than real, while the Cratère
Napoléon is certainly as
strong now as it was then,
if not stronger.

Returning with difficulty
through the upper reaches of the
gorge of the Mahylis, M. de P
we reached the hogs of sulphur-
ated water at the southwest base of the cone of Grande Sou-
pière and found them to be distinctly lower in temperature
(to the hand) than they were in 1903 and 1908. There are
warm springs in other parts of the island, but nothing is
known about their actual tem-
peratures (but look up Le
Bonheur's descriptions)
or any changes that may
have taken place within re-
cent years.

(N.B. From my note
book 9dfrp 1. Mt. 35 to 47
and the literature pre-
pare a sketch of the rest
of the island.)
Guadeloupe.

Grande Terre

tow

The Grande Terre portion of Guadeloupe is larger than the mountainous Basse Terre part, from which it is separated by broad mangrove swamps. Through these flows back and forth with the tide the brackish arm of the sea called the Rivière Salée, freshened by the rivers flowing constantly from the mountain of Basse Terre and during the rainy season from the flat surface of Grande Terre as well. A slight current sets through the river.
times northward and sometimes southward under the influence of the easterly trade winds. [N.B. Find out whether the current is variable in direction and how variable in strength.]

The mangrove swamps look to be impassable, but shallow, tortuous natural canals give boat access to most parts of them. They are a great resort for ducks and other migratory water birds during the winter months and hunters' huts are perched on piles in some of the lagoons in their northern part. The high way from Pointe à Pitre the commercial center to Basse Terre the political capital of the colony crosses the Rivière
Salée by means of a pontoon drawbridge, cultivation comes out a short distance onto the flats bordering the swamps, but not far, since the land is too wet to support it.

Grande Terre is at an almost equal-sided triangle comprising 600 square miles in area. It is roughly speaking an isosceles triangle lying upon one of its longer sides. Its southern side extends nearly from Cape — nearly due east to Point des Chateaux twenty miles. Its windward side stretches another twenty miles from Point des Chateaux northwestward to the Grande Vigie. Its western
side, fifteen miles long, runs irregularly S. W. from Grande Vigie to our starting point - Pointe à Pitie, with a population of about 20,000 people, lies at the northern end of the southern one third of the western side. The surface of this portion of the double island of Guadeloupe is undulating, but no hill rises more than 200 feet above the sea. The south-western part of the triangle might even be described as hilly, while the northern angle shows a fairly steep bluff 80 to 100 feet high running southward for about 6 miles from Grande Vigie toward the middle of the island. No permanent stream of water is
found in any of the shallow valleys.

Grande Terre is an elevated coral reef and shoal and the numerous fossils in some parts of its rock indicate the abundance of molluscan and other invertebrate life in the region during late Tertiary time. The coal-metal quarry on the southern edge of Pointe à Pitre at the end of Rue Alexandre Isaac are highly fossiliferous in many parts. As far as I saw, the fossils were all molds ("casts") of the interior and exterior of the shells, the shell substance having been entirely leached out. The rocks exposed in the numerous road cuttings examined
were of lime, sand, and gravel, often breccia-like in appearance, the hard lumps of which contained many small fossils, gastropods, lamellibranchs, etc., but apparently no corals in the western half of the island. (Particularly Martinique.)

Corals are abundant, however, in the upper beds at Porte d'Enfer, La Moule, and Pointe des Châteaux along the northeastern coast, and the rock of Porte d'Enfer seems to be continuous to Grande-Vigie.

At and above the sea level along this windward coast there is a beach, band fifteen or twenty feet wide. This has been made by the action of sea beating against the cliffs. It differs some
what from the overlying beds, in that distinct macroscopic fossils seem to be lacking. The rock is a calcareous meal like the cement binding together the corals and other fossils of the upper beds. The meal is perhaps algous in origin. Often it is like hardened mud in texture.
St. Vincent.

Leaving the hospitable shores of Martinique with regret at ten o'clock in the morning of Friday, 26 March, I boarded my old friend the Quebec SS Co's line "Tryona" and about half after one the ship was under weigh for St. Lucia. The day was beautiful and the three and one-half hour run across the channel between the islands was very enjoyable, giving delightful relief from the hot days spent inained St. Pierre, on the arid west-southwestern slopes of Mont Pelé and amidst the sugar plantations and torrid hills of Lamentin, Van. Chine and Gués in southeastern...
Arrived in Castries, I found that I could get passage to St. Vincent the following night in the little sloop "Flora Nevis", bound for Grenada with coal. Since this would expedite my arrival more than a week over going to Barbados and taking the Royal Mail steamer thence to Kingstown, St. Vincent, I speedily got my needful baggage and embarked on the "Flora Nevis" and bore fair well to the newly formed acquaintances of the trip from Fort de France. The evening in Castries passed quietly in the company of old friends, made en passant visits en suite to and from St. Vincent, and the following day was fully occupied with writing letters, walking about town and completing arrangements.
ment for the trip on the sloop.

Late in the afternoon, my effects were first on board the little boat, and before half after eight we were standing out of the harbor. The wind was favorable, the sky was almost cloudless, the moon lacked but three days of fullness, prospects were good for a satisfaction voyage to Kingstown. Persons who have traveled on these small coasting vessels sleep avoid their cabins and sleep on deck unless the vessel leans heavily. Hence my Castris landlord had loaned me a canvas deck chair and I soon made myself comfortable for a night in the open. The wind held so good that we crossed the channel between St. Lucia.
and St. Vincent under a reefed 14
main-sail. The sloop's master said,
that we should be at Kingstown
in twelve hours from Castries, but
we were only off the northern end
of St. Vincent at sunrise. The wind
died down and became contrary
and it took us till four o'clock
Sunday afternoon to bear down
the leeward side of the island and
reach our destination. The heat,
glare and inaction of the day over-
whelmed the beauties of the moon-
light sail across the channel.

A friend had his boat awaiting
me and it arranged with the
port authorities and the custom
house to admit our sloop without
delay in spite of the days being Sun-
day and had his boat await-
ing me, hence it did not take me long to get ashore, satisfy the customs authorities, with the aid of my letter of introduction from the British ambassador at Washington, and reach the hospitable home of my helpful friend, T. MacGregor Mac Donald, Esq. Mr. Mac Donald was a near-by eyewitness of the great eruption of the Soufrière 17 May, 1902, and kept notes which have been published [Century Magazine. See also my account in Mrs. Bull's Nat. Geog. May.] forming the best and a most useful account of what happened on that eventful day.

On the day after my arrival, the Hon. C. Gideon Murray, ad-
Minister of the colony gave me an interview in the course of which he cordially pledged the cooperation of the insular government with the American Museum in the preparation of a large-scale topographic map of the region surrounding the crater of the Soufrière. The plan was for Mr. J. Landreth Smith, the Crown surveyor of the colony, to go into camp with me on the mountain, and Tuesday afternoon I took my outfit with me to Chateaubelain by canoe, a heavy but bulky load for the little conveyance, leaving Mr. Smith to follow me by the regular mail canoe on the next day. We camped according
to schedule I went directly to 17 Richmond Vale, the manor house of the Fitzhughes Estate belonging to the Mac Donald brothers, which I made my base during the fifteen days that I spent on and about the leeward (western) side of the Soufrière. The house commands an unobstructed view of the summit of the volcano four (2) miles distant, and it was from here that Mr. Mac Donald made the valuable observations on 7 May, 1902, to which reference has already been made.

The following day, Wednesday, 31 March, was beautiful and about sunrise I left Richmond Vale for the top of the Soufrière, taking Forest Ranger Jimmy James with me as guide and footer. Arriving at the rim
of the great crater, at eleven o'clock, a beautiful panorama was spread out before my eyes. The surface of the once cold mountain lake stands many feet above the level which it held in 1908. James says in fact that the water seems to have risen higher than it was before the eruption of 1902, judging by his recollection of the old marks within the crater, but such an opinion can not have much value on account of the changes in the appearance of the crater caused by the eruption. Now occupies fully the bottom covering of the crater, the water, the talus slopes, and ridges and flats that were visible in 1903 and 1908 except for the upper most parts of the debris cones at the base of the vertical northeastern walls.
The emerald green water pre-19
wonderful combination to

dent a striking contrast in color
when compared with the grays, purples,
vegetation and grass greens of the walls of the
crater. Incorporate here 40.19a-c

After selecting a camp site in
the head of a gully thirty feet below
the rim, where it seemed as if our
tents would be protected from the
easterly trade winds, we left the
summit at 10 o'clock and went
down to Chateaubelair to meet the
mail canoe and complete arrange-
ments for making camp in the
mountain the next day. Mr. Smith
arrived according to schedule,
but on the way to Richmond
Vale to spend the night he fell
from his horse and injured his
shoulder, so that he was finally
obliged to give up the plan of going into the field on the map work. While awaiting knowledge as to the extent of Mr. Smith's injuries, I spent a day visiting the Sanikai Valley and the coast as far as Balein Point and another day on the Richmond Estate and in the gorge of the Wallibou River. Mr. Smith's shoulder getting worse, he returned to Kingston on 2 April for medical attention. I followed the next day, not deeming it advisable to spend Easter Sunday and Monday on the Soufrière on account of the numerous and sometimes boisterous young men who make an annual pilgrimage to the summit on the latter day.
On Monday, Mr. MacGregor, Macdonald and his brother Duncan and I went by automobile northward along the windward coast as far as the road was possible, and then walked a mile farther. This journey took us entirely across the area seriously affected by the 1902 eruption, from Georgetown to the south bank of the dry river on the north bank of which stands the revived village of Overland. Then, returning in the car to the Orange Hill Estate, now the property of Mr. Charles Barnard, I went on horseback with Mr. Childs, manager of the estate across its fertile fields which have been fully restored to more than their pre-eruption production of sugar-cane, and across the still
Estate to a point on the brink of the gorge of the Rabaska River where a good view was obtained of the changes which have taken place therein since my last previous visit in 1908.

It being evident that Mr. Landstadt Smith's accident was too serious to permit his going into camp with me, Dr. B. A. Spence one of his assistants was detailed to go in his place and we went to Chateaubelair in the old mail canoe "Mizpah" on Tuesday, 6 April. Telling Jimmie James to have our porters ready for an early start the next morning, I went to Richmond Vale for the night. At sunrise I was again on the
colonial Rest House in Cha-te-
Tambelain, where my camp outfit
was stored. Spencer was on
hand promptly, but it was
nearly eight o'clock before we
could get our impediments
loaded into the small row boat
that was to convey us to the mouth
of Tresle Valley, an old course of the
Mississippi River, whence the Trail
starts up the leeward side of the
Gaspésie. Here we were met
by those four porters who had
walked over from Cha-te-
Tambelain
and the interesting and amusing
process of distributing the pack-
ages so that no man should have
more than 75 pounds of weight
to carry up the mountain.
Soon after nine o'clock the
long line of 17 men, including Irwin, Spence, James and myself, were wending our way along the gently rising floor of the Iao Valley which forms the decline to the steep trail leading to the Crater rim, 2,900 feet above the sea. About two hours of steady work brought us to the rim and my men soon leveled off the spot which had been selected for a camp site. The tents were erected and everything put into order for the work of the expedition. But the nearest source of drinking water was about a mile away and 1,000 feet down the trail. The trail too was so steep for part of the distance that the “heading” of a five-gallon demijohn of water every day was no light task and we desperately wanted in the use of the
The day after our arrival at the summit gave us good weather, though the wind was strong, and we circled the crater, establishing four poles and flags on the rim for the main stations of our triangulation. This however was the beginning of a week of bad weather with almost continuous high wind and much rain. It was impossible to do any theodolite or plane table work, and Sunday morning the gale was so severe that the negroes' tent was "done bust down," to use their expression, about five o'clock. At sunrise they crawled out from under the canvas, patched up the hole and erected the tent again. Again it ripped and again was sewed up, but the repairs lasted for
only a short time before a gust of 46
wind tore the cloth beyond repair and
the wreckage could be used only for
covering the camp boxes. Meanwhile
my tent, which was a new one, was
being slatted about so in the wind
that Spence and I were keeping
renewing its anchorage in the soft
ash and lapiili, and there was con-
stant danger of its being swept a-
way down the mountain. That after-
noon we struck the good tent cached
most of our effects under the care
a good tent caching that I was in of the wrecked tent and started
down the trail in search of a more
protected camp site. This we found
in the lee of some higan-berry trees
not far from our water hole 1000
feet below the rim. Leaving
what packages we had brought down,
we proceeded to Richmond 17
Vale and Chateaubelair for the
night. The next morning we re-
turned with ten men who had
levelled off our new camp site and
down brought our luggage from the old
site, so that we were established
in our new home by 2 o'clock.
The wrecked tent was repaired so
that it could be used in the lee of
the huckleberry trees. Spence and I
with two men spent the afternoon on
the rim of the crater, but could do
no instrumental work on account
of the high wind that was blowing.
The bad weather continuing
on Sunday, Spence went down
to Chateaubelair in the afternoon and
reported to headquarters. He came
up again early the next morning
but went down again since 11 o'clock. The rain, wind, and cloud prevented any opportunity for field work on the mountain. There being less mist in the air on the 15th, James and I started for the rim in the morning at 9:30, and the weather began to clear by noon. Persistence was rewarded, and in the latter part of the afternoon conditions for theodolite work were almost ideal. The fine weather continued through the next three days and enabled me to do all the important work for which I had planned, except the making of the topographic sheet. The surface of the lava was determined as being 7,799 feet below the rim of the crater where the leeward trail arrives, and 1386 feet below the highest point of the rim, which is on the northern side.
The chief changes in the volcano as compared with 1908 and 1903 consist of the rise of the waters of the crater lake, the removal of loose ash and lapilli from parts of the mountain slopes and from the valleys of the tallowan, Rabara and other radial rivers, the advance of vegetation over the area devastated by the eruption, and the restoration of cultivation on several of the old plantations.

The surface of the lake determined by theodolite observation to be 779 feet below the point on the rim where the leeward trail arrives, or 2121 feet above the sea, taking the elevation of the rim at 2900 feet above the sea, as the average of aneboïd readings taken on three traverses of the trail on different days. The highest point of the rim, which is on the northern side of the crater rises 1386 feet above the present surface of the lake (cf. elevations on Admiralty chart). Over-
James, who is a colonial first, 19 a
range of long experience on the Soufriere
says that in his opinion the crater
lake now stands at a higher level
than it did before, judging from
beneath Kilauea Peak
landmarks with which he was
and which he now acquaints
familiar in the old days. It
seems to me, however, that not much
reliance can be placed upon
this opinion, on account of the
changes which have been produced
by the eruption. Before that took
place there was much more vegetation
on the south, southwestern and
western walls of the pit than there
is now, and the denudation
has made changes in the apparent
relations of things. There does not
seem to have been much if
any enlargement of the crater
in these quarters or on the north, above
the level of the lake's surface, 1910, but toward the northeast, east, and southeast there has been an undeterminable increase, caused by landslides into the craters from the undermined walls. This has been greatest toward the northeast where the old walls are vertical, and the slides have continued to the present. (cf. former note books and photos) Prior to May 1902 a rest house which stood on the brink of the crater where the trail from the windward side arrived at the top of the mountain James showed me that the ground on which this structure stood had disappeared. Without doubt it had slid down into the pit. The greatest activity of 1902-1903 was probably centered in the south.
Aside from the increase of vegetation the exterior of the crater, the slopes of the mountain itself, does not present much change in appearance from that of 1908. The coarser loosely compacted ash has been largely washed off, leaving behind an increased exposure of lapilli composed of countless little bombs or rounded bits of lava that became rounded and more or less nearly spherical in shape as they cooled from fusion before falling to the ground. The fine, dust-like ash retains more of the rain that falls upon it than does the coarse ash and to particles adhere to form a firm and resistant mass. It is gray in color and my helpers spoke of it as "cement."
For the tent camp site we dug through eight or nine alternations of thin beds (quarter inch to one inch thick) of the hard mud and loose coarse black sand into a bed of "dement" which we cut into for six inches without reaching its bottom. This thick layer recalled to mind the sea of soft mud which my companions, Messrs. J. B. Jaggar Jr., J. C. Curtis and J. Mac Q. MacDonald, and I waded through near this spot on 31 May, 1902, when we made the first ascent of the volcano after the great eruption began. The tenacity with which this material holds its place and resists erosion is strikingly illustrated by the caps which rest on many rocks along the sea coast near Mount Rondo. Some of these hard mud-caps are still two to three
feet in thickness and looks as if they would last for many years. Some quantities of the fine dust were deposited on the upper slopes of the moun-
tain and on the rim of the crater. Estimates of the amount would be mere guesses but it is evident that much mud
the rim at the front where the keel and
the rim there still remains a bed from three to
eight feet thick which is composed
and coarse fresh sand
principally of this material. Toward
the northwest, the increase of elevation of the rim is maintained in varying
degree partly with the mud and partly
with coarse sand, the latter predominat-
ing. Toward the southeast and east as far as the southern limit of the crater the mud is the chief deposit on
the rim, but toward the north-east, east coast, and around the southern part of the rim, coarse sand, gravel and larger debris predominate or are the whole deposit. At three places, at the east, Lurikai Peak, Lurikai Valley on the northwest side of the crater, and at the head of one of the branches of the Waihohon the new deposits have been eroded away, leaving the old ma-

terial of the rim exposed. Hence it still measures six feet in thickness. The deposits exposed now bear out the observation made at the time of the eruption that the discharge of fine dust and mud were prac-
tically confined to the southwest-
ern quadrant of the volcano, though comparatively small quantities were drifted to the W. and W. N. W. by the tradewinds.
The surface of the mind is coated with and protected by a continuous growth of moss (or lichen?). Bunch grass is abundant likewise over much of it, especially in shallow watercourses which have been camouflaged into it. This bunch grass is particularly noticeable on the steep slopes of mud within the crater in its southwestern quarter.

The grass grows even on the cinder ash where circumstances have favored the accumulation of any moisture. The eastern, northern and northwestern sides of the outer rim being covered with coarse ash and lapilli, are large barren of vegetation, but here and there there is a tuft of bunch grass
and some of the rocks are sparingly coated with lichens and a dry gray moss.

The so-called "New" crater (so-called because it is supposed to have been the locus of the 1812 eruption of the Soufrière) contained no pool of water at the time of my visit, but the area of dried mud in the bottom of the bowl indicated the position and extent of the water standing there during the preceding rainy season.

The lowest part of this crater is 330 feet by aneroid measurement above the rim at the point where the lee-ward trail arrives or 3230 feet above the sea. It is 1109 feet above the level of the lake in the big crater. There is no practicable way of determining or even of estimating
the amount of ash which has been deposited by the 1902-1903 eruption in the New Crater, because there seems to be no reliable data regarding the depth of the crater. [Look up Humboldt's Cosmogra for the evidence on which this is called the "New" crater. He may give data on its original depth. Perhaps Hutchinson's pamphlet gives the depth in recent years. Also of Flett and Anderson's report.] For the recent eruption took place.

The eastern boundary of this small crater is formed by a wall of old lava, the top of which is 140 feet above the bottom of the cone. This old rock wall is covered more thickly with vegetation than is the new ash.
anywhere on the top of the mound-tain. Mosses, tree ferns, other ferns, bunch grass, and begonias abound. At the base of this wall within the crater strong pseudo-fumaroles were active in 1903, and some warmth was rising from their vents in 1908. Now all trace of the fumaroles has disappeared, except for some reddening of the rocks beside where the vapors rose. Moss on the rockwall assists in gathering moisture here and vegetation is rank. I noted a pigeon-fern tree four feet high near one of the old vents, loci of steam discharge. Moss, grass and ferns predominate. The highest point of the rim of the New Crater is 260 feet above the present bottom, and it is part of the rim of the old crater.
level remains a barren waste of fine and coarse lapilli a half-mile across. Its lowest portions, as cut down by the shifting channels of the stream in flood time, are 15 to 20 feet below the general level of the sloping plains which marks the maximum of debris transportation and deposition in 1903. The material is too porous to retain moisture and therefore bears no vegetation. A vast amount of sand and gravel has been carried out to sea from the windward side of the mountain, principally or almost wholly through the gorge of the Rabaka. This has been distributed along the coast from the Orange Hill Estate to Cenamic 60 miles to the southward, building out
a flat beach which was roughly 129
estimated as being from 100 to 300
yards in width. The village of Georg-
town has been built upon a plain
of similar origin, which is the site
likewise of several sugar plantations.
The old plain is now ten to fifteen
feet above sea level and stretches
back to the bases of truncated sea
cliffs terminating ridges which
come down from the interior moun-
tains. Look up Humboldt
and old charts to determine
if practicable whether the George-
town plain was formed by
or prior to the eruption of
1812. Where was George Town
located on its present site? [All.
54 B] Along the middle reaches
of the Rubaga, the river bed is borded
by high walls and terraces of the new ash, indicating the extent to which the gorge was filled by lahar from the late eruption. A lahar bed exposed in the bottom of the channel near where the river emerges from the foothills and where it was first an anchorage for the chains which in the pre-emption days supported the pipe carrying mill water to the Orange Hill estate shows that the stream is now flowing in places at its old level but the coating of new material covering most of the bottom of the gorge shows that the Kaitara has not yet completed the task of carrying to the sea all the fresh ash that is likely soon to go. The heavier floods still undermine the bordering banks.
and carry out great quantities of the recently ejected débris. The upper branches of the river draining the immediate slopes of the cone are free from these from great banks of new ash than are the middle reaches, and more frequent probably on account of greater rains fall on the higher land and less concentrated erosive activity. The banks of new material in the gorge bear only a scanty growth of grass and vines, with few bushes, on a count of the porosity of the deposit, which permits rapid drainage with consequently slow decomposition.

In April (2) 1908 a pipeline for the water for the Orange Hill Estate was being laid on concrete piers across the gorge of the Babaha near where the pre-emption suspect
ed pipe crossed the stream, but (32
the builders ignored the fact that
the foundations of the piers were
bed
in new ash in the bottom of a
corroding river. The floods of
the ensuing rainy season washed
away the piers. Without learning
all this they should have learned
from that experience, the estate owners
then buried the pipe in the river
bed at the same place to serve as
an inverted siphon for the transfer
of the needed water. This too was car-
nied out by the next floods. Later a
new owner buried the pipe in
older material further down stream
and accomplished the task with
satisfaction.

The Waterloo and Orange Hill
Estates north of the Rabatka River an
Now raising sugar cane more heavily per acre than they did before the eruptions covered them with ash. On the Lot Fourteen Estate, which lies higher on the mountain than the preceding and which received a thicker deposit of ash, vegetation is pushing its way freely through the new deposit, and the manager of the plantations told me that the ground would bear richly. Cane is cultivated as far over the old fields as the present means of transportation of products will warrant. The eastern or windward side of the Soufrière receives more rainfall than the western, and vegetation therefore is much more luxuriant here.
brushes (the frigeberry) and large (34
tree ferns is now between 2400
and 2450 feet above the sea by aner-
oid determination.

On the lee-ward side of the volcano
the devastation caused by the eruption
was more thorough and recovery
on the whole
from it has been slower than
on the windward, except as favored by
greater
the retention of moisture due to the de-
positing of several layers of fine dust
to the southwest of the crater. On
this side conditions are better perhaps
than on the other for examination and
observation

description of the return of the vegetation.
Beginning at the south, the Richmond
Estate was on the southern border
of the zone of annihilation or destruc-
tion and the valley of the Richmond
River was the limit of that zone.
receiving only enough of the 1835
gas eruption cloud to destroy its
vegetation and a moderate deposit
of new ash. In this valley vegetation has
regained its former luxuriance, the
new quergua palm trees being as large
and as numerous as those that
were killed. [Ill. 60 B]
The plateau
on which the manor house stands
was covered with a bed two to five feet
thick. This became well compacted, but
its surface is covered with grass and
and occasional "cure-for-all"
bushes while the numerous drainage
courses in it are thick with bushes,
silver" ferns and other coarse plants.
[Ill. 22, 61 A, B + 62 A] Cattle
are fastened here. The ash-drift
covering the site of Richmond
village, which occupied the shore
near the manor house, is fifteen
from three to twenty feet thick
(Look up 1902 notes of 1903 photo)
and is now deeply carined by drainage from the plateau. It is too porous and well drained to support much vegetation and in most only scanty grass and few bushes. The sea has carried away a considerable slice of the shore since 1902-1903.

[cf. 1902 + 1903 photos] Advancing up the Bunkers Hill ridge, which is a part of this estate, one notes that the fine mud which held its place so well in 1902 and 1903, was never washed away but is now recognizable and is covered with grass and other vegetation.

[14. 22. 62 B. + cf. 1902 + 1903 photos. Also look at 1908 photos. Same ridge.] [cf. Sands's article on the plants.] Also Flett & Anderson
the plateau the deposit of new ash becomes thicker and coarser. A equally ten feet deep near the edge of the Wallibon gorge does not cut through to the bottom of it. Vegetation is nearly absent from this flat of the flat, the grass being very thin and there being almost none of the bushes here. The ash contains many bombs from 6 to 12 inches in diameter and some that are even 15 inches across.

[Pl. 22, 62 A] The illustration shows the northern, more barren flat of the little plateau and brings out the new drainage features.

On this ridge a fir tree is very prominent. It is about 2 feet in diameter and James insists that it has grown up since the erup-
tion. The gru-gru palm is a tree of much more rapid growth than the ficius, and the ridge bears many that are 20 to 24 inches in diameter. These certainly have grown up since the eruption, for the photograph of the same region taken in 1902 and 1903 show no living trees, while here and there stands the charred trunk of a pre-eruption palm as a mute witness of the destruction wrought by the clouds of incandescent ash.

The Wallowa River has carried out to sea an enormous quantity of the volcanic debris which was deposited on its watershed and in its gorge by the eruption of 1902-1903, but it is still running considerably above its old grade.
particularly noticeable in

the flood plain at its mouth. This
plain extends about one-fourth
mile inland from the sea and is
about the one-fourth (one-half)
mile wide at the sea. The head of
the delta plain, which is assumed
to be at the line where the river
leaves the shore hills on its north
side (Wabbleon Estate), is fifty feet
above sea level, by soundings readings,
and is one hundred yards wide.

The delta plain has increased in
area since 1908 through cutting
away by floods of the low shore plateau
on which I pitched my tent in 1908
at the base of cliffs of the Wabbleon Estate
on the north side of the river. This low
plateau, the top of which was 20 to 25 feet
above the sea, was composed of a heavy
deposit of ash from the 1812 eruption. The runcapped with a bed five to eight feet thick of debris from the 1902-1903 outburst. The washing away of this small plateau exposed the ruins of the Wallitoon sugar mill, which was destroyed by the eruption of 1812. Material increase of the delta plain has also been effected at the expense of the sea. Accurate surveys and topography which would establish the amount of gain are lacking, but appearances indicate that 100 yards would be a low estimate to put on the gain at this point.

[Ill. 22, 67A; 82 A; 61B]

The thickness of the new material in the delta plain can only be guessed, but judging from position of the ruins of the old Wallitoon estate mill as compared with the elevation of the
head of the plain above the sea is 61.
may be roughly estimated at from 20 to 25 feet. This thickness is subject constant change until grade level has become established. That the plain has stood at a higher level than now is shown by a terrace on its south side [ill. 22, 66 B]

That its level is being lowered is shown by the trenches cut by the present stream.

Lowering of level in the bed of the Wallibon is most noticeable in the

37

two-mile stretch between the face of the Wallibon estate bluff fronting the sea and a rock wall, an old lava

Constant flow from the Soufrière, where the drainage

wooded from the northern slopes of Richmond Peak and the intermittent flow from bare the southern slopes of the Soufrière
On a narrow torrent

corne through to flowing in its 42
	n old channel. Here the river fills its
	n rock bed and is so deep and swift,
	even in the middle of the dry season,

as to be impassable. The same

conditions prevailed as this lava wall

in 1903 and 1908. In the angels

and side carvings of the gorge there

still stand lofty bases of raw ash

which except for loss of height due to

settling, give a measure of the depth

made by the recent eruption and show

that it was from 100 to 150 feet deep.

(Cf. former note before this depth)

About a mile from the sea is

the old bend in the gorge which re-

ceived an immense amount of

ash in May, 1907, and was the locus

of the ash fountain action produced

by the access of water to the inferior
and which was so well developed here that it then received the name of "Wallisbon action." [Hovey Mus Bull and Nat. Geo...[Ill. xxii, 63 A. cf. photo same area in 1902, 1903 + 1908.] The concave side of the gorge now shows nine terraces one above another. The uppermost and possibly the two next below it are the original deposits from outbursts of the volcano and are now covered with sparse vegetation. The remainder are flood-plain terraces.

In 1903, hot water was seeping out from the bottom layers of some of these basins and there were places in them where steam or hot vapor issued [Cf. 1903 note book]. In 1908, the outflowing water still was warm (?), but now the drainage level is below the old outlets and there is
As apparent evidence of elevated temperatures remaining in the beds.
A half-mile farther up stream begins the section of the northern bank which was characterized in 1903 by countless flows of hot dust [Honey, u.s. A. & c. 1903 photos] and secondary eruptions of that material. Here the bed of the stream is at least 30 feet below the level occupied by it in 1903. [How about 1908?]
The river appears not to be cutting down into deposits which antedate 1902. The massive beds of dry new ash, discolored by their southeasterly exposure, discharge much dry sand and gravel. This collects in cones during the dry seasons at their bases and furnishes a not unimportant contribution to the debris carried out by the river when it is in flood.
The crater shows the site of a dust crater and flow which were photo'd in 1903. Note the little pinnacle then left and still standing in 1915.

The deposits of 1902-1903, like those of 1872 and before, made natural charcoal from some of the trees which they buried. Much of this has been collected by the negro natives of the island and used as fuel, about two and one-half miles from the sea. The stumps and roots of a silk cotton tree changed to such charcoal beside the stream stand in their original position. This does not necessarily indicate that the stream is flowing on its old bed, for the water may well have flowed elsewhere when the tree was alive.
In some places the river is cutting down into its old bed, removing ash which pre-dates the eruption of 1902. One of these places is about two miles from the sea, where the filling of new ash was so deep that the revived stream cut off a sharp angle of the old wall, thus straightening its course. A sharp pinnacle has been left in the middle of the gorge which is about 50 feet high. The upper 15 feet of this pinnacle consists of new material, but the lower 35 feet is cut through older deposits. Its base is about 250 feet above sea level. The pinnacle is backed by the remains of one of the higher flood plain terraces. Upstream from the pinnacle the large boulders in the bottom of the
gorge are arranged in confused terraces, above which six terraces are distinct [Del. xxii, 664] in the southern side of the gorge.

Northward of the Wailuhon River, the only gorge of importance with reference to the recent eruption is that of the Lanikai River. This drains the valley between the crater and its Somma ring on the north as far as a line drawn about midway of the longer diameter of the great crater and near the northwestern side of the New crater. With the present barrenness of the drainage basin, no water flows in the Lanikai, except after a downfall of rain. Much ash has been carried out of the gorge and off from its slopes since 1908. In that year the slope
of the river bed was gradual for two-\textsuperscript{1/4} thirds of a mile from the sea. The lowest of the lava flows, exposed in 1903-1908 as a ridge in the bed of the river about 450 yards from the strand line, is now the capping of a vertical precipice 25 feet high forming a water face in the stream. Its exposed edge is about 15 feet thick and the flow rests upon an old bed of ash. As has been noted in previous descriptions of the Soufrière there were many extrusions of lava (augite andesite) in the earlier history of the volcano. In 1907 I described the U-shaped rock gorges of the Sairi-kaei and illustrated them. The best example extends from 650 to 725 yards from the sea and is in the
fourth lava flow from the bottom of the section exposed by the valley. It seems to be deeper than it was in 1903 [22, xii, 69 A] at any rate, it is evident that scouring of the rockbed is active during the lastings of the floods, which still are heavily laden with sand, gravel, and boulders from the sides and head of the valley.

Three-fourths of a mile from the sea [cf. distance published] and 470 feet by aneroid measurement above it is the 30-foot precipice, formed by the edge of a lava flow crossing the gorge, which stopped my advance of the valley on my previous visit. Now a ladder brought with us from Chateaubelair enabled me and my men to scale the ledge and
go further up the gorge; but we could not go far, for 225 yards advance brought us to the foot of a precipice estimated to be 300 feet high, forming part of the walls of a basin in the stream bed which was 80 yards long by 50 yards wide. The floor of this basin is 620 feet above the sea. The upper part of the precipice is composed of a heavy lava flow which is inclined at a low angle down the gorge. The lower part of the flow is flat, the upper part roughly columnar in structure. The major portion of the section given by the precipice is unsorted tuffs, showing slight indications of aerial bedding. Lines of sand on the walls of the basin, some of the show stages passed through in the filling and excavation of the gorge.

[Ed. XXII, 71/18]
The remainder of the valley is accessible from the rim of the crater, and its whole length can be examined from the ridge, leading westward from Lanikai Peak. From the brink of the big precipice up to the base of the peak marking the beginning of the Somma ring, the bed of the stream is a trough cut into the upper surfaces of two or three lava flows, which are separated by low precipices, the flows being comparatively thin on their lower edges and not separated by heavy beds of ash. The cirque-like forms which characterize the drainage in the new ash on the leeward (western) side of the Soufrière are well developed on the slopes of the upper portion of the Lari
Kai Valley, as is shown in the illus.

2

tration Plate 00 [Ill. XXXI, 75 B+ A]

That this form of drainage character-
ized the removal of the ash deposit-
ed by previous eruptions is well
shown on the north side of the Tresfe
Valley. (Plate 00) [Ill. XXXI, 82 B]

Northward from Lani Kai Valley
the devastation which was brought
by the outbursts of 1902 and 1903 was
cased by showers of ash drifted
over the northwestern section of
the island by the trade winds.
Vegetation was destroyed as far
as Balaie Point [cf. 1902 No. 115],
but the old soil was not injured,
hence the restoration of plant
life to its former luxuriance
has been complete. The caps

of fine dust on boulders along shore
north of Mone Ranoe has been described.
A trip up the leeward trail to the summit of the volcano gives one a good idea of the advance which vegetation is making and of other changes which have taken place since the eruption devastated this section of the mountain. The trail now ascends the bottom of the Tungurahua, or Dry Wallitoum, Valley for a mile to a point 410 feet by aneroid above the sea. Here begins a winding, steep zigzag path up the bordering wall of the gorge, which is 300 feet high, through one of the new "tea-planting prop-rietor " plantations recently established in the island under the encouragement of the Colonial Government. Attaining the edge of the gorge will 300 feet above the bottom of the valley at the foot of the trail the trail attains
the crest of one of the radial ridges characterizing the mountain, which it follows to a junction with the old trail about 1000 feet above the sea. Below this point the old trail has become difficult to traverse and has been abandoned. Thus far the old soil on the two slopes was not destroyed by the eruption blasts or buried deeply in the new deposits of ash and mud. Hence the fertility of the soil was not diminished and the restoration of the plant life has been rapid. The slopes and crests of the ridge are covered with luxuriant vegetation. Near the junction of the new with the old trail there is a Spanish ash [check up Sands article for scientific name] tree about 25 feet high and with a trunk 12 inches in diameter which has grown up
since the eruption. From the junction of the trail follows the crest of the left bank of the canyon of the Roqueo River all the way to the rim of the crater, at three or more places the divide between the Roqueo and the branches of the Trespe (Dry Wa- libon) River is reduced to knife-edge breadth or but little wider.

As on Brunkeenhill and elsewhere on similar places the fine dust has kept its place on the crests of the ridges through the cementation which has already been described. This has given good foothold for a heavy growth of grass (name?) and morning glory (Ipomoea) and other vines. Along the slopes up to 1100 feet above the sea and perhaps higher there are many of the Spanish-husk trees 8" in diameter.
[Photos from 1902 are covered
will be utilized in illustrating the
leeward trail.] while along and
near the crests the heavy grass is
shoulder-high and the vines form
dangerous traps for the feet.

At 1600 feet above tide, one comes
upon the location of the old "half-
way tree", which was a great
figus that was overturned by
the eruption blast [ill. 1902]
and all trace of which has now
disappeared. About 30 feet dis-
tant down the southern slope of
the ridge a young ficus has sprung
up and now is about 20 feet high;
which will soon take the place of
the old landmark in the minds
of the users of this trail across
the island. Two hundred feet
higher what is now the uppermost clump of friggin' berry trees is traversed at the beginning of the steep mud covered slope of 1902 [ill. from 1902 photos] The trees are now 10 to 20 feet high and the formation the second camp site of 1915, an excellent situation. Here too tree ferns, club mosses and begonias abound and flourish. Within 100 feet above this little grove vines and grass disappear from the trail and the mountainside becomes much less covered with vegetation. There for 500 or 600 feet of rise one toils up a steep slope which was coated with gravel like little bombs by the outburst of September 19, 1902. The stones now bear sparsely the short stumps of a hard,
Dry gray moss and some

for the last half
mile of the trail, the ridge rises at
a gentler angle, mounting but
300 or 400 feet to the rim of the

This part again is covered

with the compacted fine dust of the
May outburst of the volcano. This

material retaining moisture well,

its surface is thoroughly covered

and well protected by a thick coating

of a flat-leaved moss (Moss?)

Consult Mrs. Britton and

show her the specimen, No.

540, collected at the site of

my first camp,) which retains

erosion. Here and there grows a

tuft of grass or a little bush.

End of St. Vincent Section.

"Cluett" voyage follows.
The Arctic Voyage of the Schooner "George B. Chubb"

In July, 1913, the American Museum of Natural History and with the co-operation of the American Geographical Society, the University of Illinois and the assistance of departments of the United States Government, several sister educational institutions and scores of corporations, business firms and private individuals, despatched into the Arctic regions by way of northwest Greenland an exploratory and scientific expedition, known as the Crocker Land Expedition. Preparation for the work of the expedition was begun under the leadership of George
Bown and Donald B. MacMillan, who were two of Bown's trusted assistants in the admiral's famous dash to the North Pole, but were brought to a sudden halt by the sad drowning on 28 April, 1911, of Mr. Bown, a sad accident which deprived the world of a most enthusiastic and promising young explorer in the very beginning of his career. The enterprise was therefore organized under Mr. MacMillan and constituted a memorial to George Bown. Its scope was enlarged and an excellent scientific staff engaged comprising Ensign (now Lieutenant) Fitzhugh Green, U.S.N., engineer and physicist; W. Elmer Ekblaw, geologist and botanist; Maurice C. Tangney, Ph.D., zoologist, and
Harrison J. Hunt, M.D., surgeon and bacteriologist. To the staff were added Jerome Lee Allen, an expert wireless operator in the United States Navy, as electrician, and Jonathan C. Small as mechanic and cook. Mr. MacMillan took charge of entomology and ornithology. Thus splendidly equipped for scientific work and with an exceptionally complete outfit of instruments and supplies, the Expedition established itself at Etah in latitude 78° 20' N. on the coast of Northwest Greenland in August, 1913, and entered upon the carrying out of its broad and comprehensive programme.

Leaving to others the narration of the experiences of the Expedition staff and the description of the work accomplished by them,
I propose to give an account of the voyage of the auxiliary schooner "George B. Cluett", the vessel which was sent northward under charter to the American Museum of the summer of 1915, for the purpose of bringing back from Baffin Land the members of the staff and the collections and property of the Expedition. The "Cluett" is well known to the American public through belonging to the Grenfell Association and being engaged in promoting Dr. Grenfell's medical missionary work among the fishermen of northern Newfoundland and Labrador. The master of the vessel is Captain Harris C. Pickels, a deep-sea mariner of many years experience in all the seven oceans.
Until Friday, 16 July, the crew of the northern lady Adelaide 134 engaged twelve men in the chase.

Believed by a Luchoo Wind in the race, George Cooper and an experienced oarsman were selected as master of the ship, and provided a little tobacco for the voyage as an aide to their song. The museum aboard the northern lady is a thousand pounds, including a piano.

The crew reminds the observer to open fifty-five tons of the hundred-thousand-dollar lines on board. The lady.

The lady's lady.
an additional year in the Arctic according to his expressed desire, sundry boxes sent to the various members of the staff by their friends in America, Captain Cook and I and our baggage were got on board, some repairs were effected to the vessel, a new one was installed and at six o'clock in the afternoon of Monday the nineteenth, lines were cast off from the Ingraham Wharf, the motor was started up and we got under weigh for the Far North, full of anticipation of an agreeable and interesting voyage to a rarely visited portion of the globe and a safe return to civilization and Rome in the early
autumn. Like many deep
water ship masters, Captain Pickels
and Captain Come are good story

tellers and the evening of our
long voyage was made memorable
to me by the narration of some
of their varied experiences.

for the first twenty four hours, at
Our run first under engine power
and then under sail, was 125 sea
miles. If we could maintain even
that record as an average, the suc-
cess of our undertaking would be
assured, but internal com-
bustion engines are uncertain
agents, and the wind is famed
for its unreliability. During
the following night the engine was
put out of commission by a
crack which developed in the
hub of the fly wheel caused by
The constant recurring necessity of driving in the steel key arising from the looseness of the flywheel, which was a new one, on the crankshaft, which was old and worn. It took us six days to reach Battle Harbor, a Labrador harbor for fishing vessels made famous by the many Arctic expeditions which have touched at and reported from it, whereas under proper conditions we should have made the journey in three days as by

[Note on B.H. & the Newfoundland mission]

most an incident of our sail through the Strait of Belle Isle was a distant view of Barge Rock, near Red Bay, where, miles off her course, the steamship "Dianna", the first vessel chartered for the Croker Land Expedition, went ashore in July, 1913, and would have wrecked the whole enterprise had not exceptionally calm...
weather prevailed for several days.

Crude repairs, but the best that could be affected under the circumstances, were made to the flywheel by Captainickets and the engineers at the little village blacksmith shop, and we sailed away from Battle Harbor at four o'clock on the 26th with revised hopes. Begin copying here:

We had no more than settled down to fine sailing with the favorable breeze when great excitement arose over Chum, the captain's splendid, full-blooded Newfoundland dog. The report came off that Chum was dying and the captain went forward at once to investigate. I followed a moment afterward but had gotten no farther than.
the main hatch, when I saw the captain jumping for the starboard fore rigging, the crew scattering in every direction and Chum coming around the side of the forward deck house, wild-eyed and frothing at the mouth. One glance was enough for me, and I started for my room. I could not go down the forward companion way to the cabin, because the two mates were already there with Charlie, our cabin boy, on top of them. I rushed around to the after companion way and down to my room, where I met Charlie, who had somehow managed to get past the mates, who now were in the dining room braced against the door to keep out the dog, which occupied the forward companion way.
to the exclusion of all others. Chum [11] being where he could do no harm, the captain and some of the crew came aft and lassoed the dog and dragged him up onto the deck, where a furl or two of seawater dashed over him cooled him off and brought him out of his fit.

Poor fellow! He had too much salt meal to eat and was suffering from too much warm weather and too little exercise. He did not attack anyone, he had the headache and merely wished to get into some place where he could be quiet and alone.

Late in the afternoon of Monday, 2 August, we sighted the Greenland coast through the mist. The land was Camel's Hump, a mountain 10,000 feet high in latitude. We
were driven by a favorable gale and made 210 miles that day. Even the captains admitted that there was "quite a breeze from the north" and we went flying through Davis Strait, crossing the Arctic Circle about midnight of 3 August.

The Greenland coast is bold and picturesque, and the grandeur of its scenery is to be compared with that of Norway. Numerous deep narrow fjords indent the shore line. Granitic mountains 3000 to 5000 feet in height rise precipitously from the water. Countless glaciers, most of them nameless as well, descend the cliffs from high snow fields or the heavy ice cap in bands of brilliant dazzling white. The ice cap itself being visible from the heads of the fjords.
If this region as far north as upper 1/3 
as far 

Nivik, or even as the Devil's Thumb 
at the southern limit of Melville Bay, 
were as well known to the traveling 

public as the coast of Norway, it would be visited every summer 

by tourists from America and they would be delighted with their 

experiences.

The wind died out and flat 

Calm settled upon us half-way across the broad entrance of Disco Bay 

and at half after ten in the evening of 4 August I went to my room, 

thinking that we should not 

reach the harbor of Godhavn, Disco, that night, where we were to make 

our first stop in Greenland. Soon, however, the engineer called me say-

ing that the captain wanted me to
come on deck to see a peculiar black cloud ahead of us. Directly across our bows the long line of lofty cliffs forming the southern coast of Disko Island rose, half exposed above a heavy bank of fog which rose as an opaque gray plane, and it looked as if our course lay directly up the slope. Here and there an iceberg could be made out indistinctly through the mist about us, while an occasional one could be seen the pinacals of which rose above the thin outer edge of the fog bank. The dull cough of bowing whales added a touch of weirdness to the scene, which varied was further embellished once in a while by the boom of ice falling from the bergs. For several minutes our
attention was held by a great sulphur-bottom whale swimming leisurely past us near the surface of the water without heeding the vessel. When the monster finally sounded, his flukes were seen to be sixteen or eighteen feet across. Screaming gulls circled about the whale and settled eagerly to the water each time it approached the surface, evidently getting food in the churning mad by the animals rising back.

As we slowly advanced by use of our engine, the great fog bank gradually dissipated and by half after twelve it disappeared altogether, and the features of the hills could be dimly discerned. The sun was below the horizon at midnight but the twilight was strong.
Captain Pickard held straight to his course until he reached almost ashore, having passed the beacon and the outer peninsula, and then swung through a right angle to the east and went through the narrow entrance to the little harbor, which is completely landlocked, and cast anchor in ten fathoms of water at 1:30 in the morning of 5 August. There are no lighthouses along the Greenland coast, and the moderate illumination from the southern sky cast the town and its low, hilly peninsula into the heavy shadows of the great shore cliffs, which rise almost vertically from the strand to a height of 1200 feet above the sea. Neither are
there adequate charts or suf-

ficiently explicit sailing direc-
tions. Hence, to make this little
harbor in the middle of the night
without a pilot was a remarka-
ble performance and we took off
our hats in acknowledgment
of the captain’s skill.

As we came to anchor we
saw a little procession setting
out toward us from the landing
place on the rocks in front of the
diminutive
most pretentious house in the little
village. The line consisted of the
white rowboat of the Royal Danish
Inspector followed by several Kay-
aks, or native sealskin boats, with
one Eskimo in each. The inspector
whose name is H. Lindow,
is a tall, fine-looking young
Dane, named H. Lindow. He
is the chief government official for the whole of North Greenland, a district which stretches from Nord Strøms Fjord (lat. 67° 30') to Davis Strait (74° 35') at the southern border of Melville Bay, which is the northern limit of Danish authority. The inspector was duly informed with the letter of introduction from the Royal Danish Minister at Washington to the officials of Greenland which the American Museum had procured for me, served cordial and permission to land was freely granted to the vessel's officers and myself. The crew however could not be allowed on shore nor could any Eskimos be permitted to come on board, because we had no bill of health from our last
post, raised by the Danish consul.

Our "last port" had been Battle Harbor, where no bill of health could be obtained, and where no consuls are stationed.

Nevertheless, permission was given for our crew to fill our water tanks from a designated brook on the opposite side of the harbor from the village.

Godshavn (Good Harbor) is a straggling settlement comprised of five Danish and twenty-five or thirty Eskimo families. Many of the latter show the evidences of admixture of white blood.

It is the capital of Danish North Greenland and the most prominent building structure in it, is aside from the church, is the building which contains the rooms devoted to
The meetings of the native form a truant since 1912. For the first four years, the Danish government has been trying the experiment of partial local self-government and the new parliament consists of about 60 districts, which are subdivided into 37 communities. The experiment effort is not a great success yet, but the natives are gradually learning. They are too individualistic in temperament to adhere to a code by general agreement, which seem for the moment to be contrary to their separate interests. The recently royal government has established a scientific station for the purpose of studying the ethnology, botany, geology and zoology of North Greenland. Dr. Morton P. Forsild, a scientist of inter-
national repute, is in charge of the work and he has made and published important studies on the material culture of the Eskimos and on the flora of the Disko Sound region. [Look up the scope and work of this station]

Mr. Poulsen is a sturdy Dane in the fifties, much interested in Greenland and in Arctic life aside from his professional work. He has gotten together at his home interesting and important collection of Greenland objects which he is always delighted to show to visitors. Like all the Danes whom I met, he is the soul of hospitality. Godhavn is an important station of the Royal Danish Trading Co. and is in charge of Mr. Bistrup, at the time of my visit.
who is Greenland born, Dekel (22),
his father and grandfather before him, his great grandfather having come from Denmark. The agents
of this company have certain administrative duties to perform in connection with the government, which are important in the absence of the inspector, and they are locally called "governor."

The Danes' houses are substantially built of lumber, bought of course from Denmark, and have double windows, which are provided with solid board shutters. The stone foundations are reinforced with turf outside and further protection from the intense cold of winter is secured by banking the houses with snow up to the
lower windows at the beginning of the winter. The inspector’s home is large and comfortable. It is one story high in front, facing the north, and two stories high in the rear. The office is in front, while the pleasant rear facing the sun is devoted to living and bed rooms in which the windows are kept bright and attractive with flowering plants. The inspector and the governor are proud of these vegetable gardens behind their homes where they raise small quantities of lettuce, cabbages, radish- es, turnips and potatoes under glass. Coal of Tertiary geological age is obtained at several places on the island of Disko.
and is much used at God. (24)

haven and elsewhere along
the coast. It is rather friable
and leaves much ash when
burned, but it is an impor-
tant factor in the lives of the
Danes and many of the indi-
viduals in Danish Greenland.

The first building in Godhavn
to attract the attention of the
traveler approaching from the
west, south, or east is the Lu-
theran church, which is
situated on high land on the
eastern border of the settlement.

Lutheran churches and missions
are maintained throughout
Greenland by a Danish mission
ary society with the sanction
and help of the Royal Government.
The pastors of these churches are stated to be doing good work among the Eskimos as well as the Danes. At some, if not all, settlements where there are churches the pastors are the teachers in the schools as well. I was told that most of the Eskimos can read and some of them can write.

The hulk of the steamship "Fox," the famous ship in which Captain F. R. McClintock, R.N., made his successful hunt for proof of the fate of the Sir John Franklin expedition lies beached at Godhavn and is an object to interest all arctic travelers. After completing her work in the Far North, she was sold to the Danes and was used for thirty years in the transportation of cargo.
lute to mariner from the mines at Ígikut, South Greenland. She was then refitted and was used as a
mail and trading ship along the
Greenland Coast until the season
of 1917, when she struck on a rock
and received injuries that were
too severe for local repair or to
mit take her to European shipyard
and she was abandoned. Her
Mizzenmast is gone and she is
otherwise much dismantled.

[ill. photo of ss "Fox"] Cap-
tain Pickels secured the end of
an oak bit for the Museum and
several pieces of teak from her o-
iginal timbers. The latter proved
very useful during the long months
of our detention in the ice through fur-
rishing many hours of employment.
native iron in basalt—my chief object in stopping at Disko being to visit this locality and collect specimens for the American Museum.

The day was perfectly calm and the sea glassy, so that the run of some twenty miles along the coast was most enjoyable. We landed beside a rocky point formed by an ancient lava flow, where the motor boat would be safe, and walked a mile or two along the coast before reaching the exact place where Norderstorp collected.

Then I learned, to my great disappointment, that the masses of iron were found in the water and were to be exposed or visible only at low tide, and that none had been found for lack of demand.
for two or three years. We might better have brought the "Cluett" a
long and thus not have been obliged to go back to Godthaab!
But we could not have sailed her, for lack of wind, hence we
really lost no time. Orfak (or
Ufak, as it is also called) is at the
base of lofty cliffs forming Najat
Mountain, which is about 2200
feet high and receives its name,
meaning Nest Mountain, from the
myriads of sea birds that frequent
its cavities every summer.

Returning to our landing place
we partook of an excellent luncheon
provided by the inspector and con-
sisting of rye bread, Danish butter,
anchovies, Roquefort cheese, bottled
Danish beer and cordial—quite a
spread to friocene in latitude 69° 20' N, on the apparently inhos-
patible coast of Greenland. Then
we boarded our launch and started
back to the vessel. On the way we put
in at a shallow bay to get some
fresh fish from a family of Eski-
mos having their summer tups
(olintent) there. Our tender was
a stubby little boat about seven
feet long belonging to the inspector
and not intended to hold more
than two or three people. As the
inspector, the governor and I push-
ed off from the launch, the cap-
tain stepped into the bow and
loaded the little craft down so that
we had only about two inches of
freeboard left and we had to
still sit as still as the proverbial
church mouse to avoid swampings. The shore was bordered with a leaf of kelp and other seaweed, two feet high and ten feet wide, which made a bad place for landing. When our tender's bows stuck in this slide, the following gentle surf wave curled over the stem and wet us in good shape and our condition was not improved by wading through the seaweed. We found the natives drying, salting and smoking sea trout, which are abundant in the bay. We bought some fine fresh ones for the equivalent of a few cents in American money and then the Eskimos threw in two large trout for a bit of tobacco, the natives being extra quiet.
fond of the weed. The trout as big
used are from twenty to thirty inches
long. Their color is somewhat light
er pink than that of the salmon,
and they are finer in texture and
more delicate in flavor. The smok-
ing is done by means of a fire of
dried salmon in a little structure
built of stones and turf.

Regaining the launch without
trouble, but not until in two trips
instead of one, we continued our
homeward journey in the waning
daylight of the waning even-
ing. There was scarcely a ripple
on the surface of the ocean, but
the gentle swell reflected in ma-
velous beauty the colors of the
night clouds, intensifying them
indeed to gold, plumbe and green.
I felt that Bradford, Stokes, and other artists were justified in the color schemes that they have used in depicting Arctic sunsets. When we reached the "Claret" the sun was well down behind the mountains, but the waning moon was hanging midway over a deep valley cutting the cliffs near the village. I thought that it was the new moon, until I realized that the crescent shape faced the wrong way and was on the wrong side of the sun for that phase of the orb.

The weather continuing to be perfectly calm, so that it was useless to try to sail, I took the launch the following day, with the inspector, the governor and
Captain Corner, for a twelve-mile run eastward along the coast to see the nearest of the coal beds of the island. The coal is of Tertiary geological age and was formed in embayments in the older lava beds, when the land stood at a lower level than it does now. It proves, that the climate of Greenland was much milder then than it is now, in fact that it was known temperate or perhaps subtropical in character [verify this], for the coal bands contain off carbonized wood in large fragments which is more like charcoal than it is like true coal in texture, besides abundant impressions of leaves and other plant remains.
Climbing to the top of the shore cliffs, which here are only about one hundred feet high, we came upon a narrow plateau sloping upward to the base of the lofty parapets of reddened beds of lava and volcanic ash. The plateau is covered with a thick carpet of vegetation, consisting of the Arctic willow, a sain, several flowering plants among which a yellow fluffy is conspicuous, grass, mosses and lichens. But the largest of the willow trees have trunks only six or seven feet long and they are from shiny. The “forest” rises scarcely to a man’s waist. The ground or nearly so. The flora of the southern coast of Disko is of particular interest to botanists, because the region forms a border or transition zone between the sub-arctic and Arctic regions. The view from
from the top of the cliff was beautiful. In the extreme — Disko Sound lay under a summer sky, with glassy, blue water dotted with scores or perhaps hundreds of icebergs of all sizes, and the surrounding mountains, green clad half-way up their abrupt southern slopes but bare red and brown above, with great patches of snow here and there and the vast permanent ice cap covering and covering all.

We were much interested in the kayaks or native boats of the Eskimos who clustered about the "Chief" offering models of boats and sledges and earnings of walruses and narwhal ivory for sale or barter. The kayak is a remarkable little boat about fourteen feet long and twenty to twenty-two inches wide at the waist, when
Built for one person use as it is usually is - The frame is of light wood which is covered completely with seal hide, except in the middle where the user sits. Five hides, deprived of the hair, are needed for the cover. They are stretched over the frame while wet and sewed together with sinew. The covering must be accomplished about sitting and is done by several women working together, like New England women at an old-fashioned quilting bee. Kayaks are cranky affairs, but the men paddle about in them fearlessly, going miles out from shore when hunting or fishing, protecting themselves from dashing water with a seal-skin apron fastened around the cockpit and tied about the body under the arms. A double-ended paddle
tipped with bone or ivory as the.no. 138
two pieces and it is used most skil-
fully in driving the kayak at a great
speed through, quiet water or in con-
tending with waves. On the kayak's
deck are carried, harpoon, duck spear,
riple, fishingline, knife and ice knife
and the boat is used not alone for catching
sea trout and birds, but also halibut,
seal, narwhal and walrus. (How
for south do they catch narwhal and
walrus?) The bow of the kayak is
edged with bone or iron as a protection
against ice and the ice knife is used
to prevent young ice from cutting
the sides of the boat.

The inspector and the governor
came off to take supper on board
our vessel, the former doing honor
to the occasion by donning his full
official uniform. Yankee Nu - 139
than had prepared an extra menu,
according to his standard and
our guests seemed to enjoy the
meal. At any rate, it was a change
from shore diet, and landsmen
seem to like ship food as much
as sailors like to eat on land.
After supper I started up the vic-
trola, which I was taking northward
for Admiral Peary as a gift from
him to Ootah, who was one of his com-
fellows at the North Pole. It devel-
oped that the inspector was a violinist
hence he greatly enjoyed the Kreisler,
Elman and Zimbalist records
that I had with me for the Crocker
Land Expedition staff, while the
opera records brought to mind
old days in Europe. About ten
o'clock Mr. Powild, having returned earlier in the evening from an Eastward cruise in his power boat, told us much about Greenland and said that we were quite early enough for the attempt on Melville Bay, because the preceding winter had been exceptionally severe and the bay would be choked with ice till late in the summer.

Our guests all left us by midnight and at 4.30 the next morning, the seventh, Captain Pickles began leaving the anchor, since it seemed best to all of us to put our trust in spite of the continuing calm. The engine propelled us out clear of the coast and then was stopped, the broken fly wheel making the captain already on the way.
isting under power. The day was clear, bright and beautiful, but we made little progress. Sunday was the same, and the captain's observations showed an advance of only 35 miles for the two days. I began to get anxious about our journey on account of the long-continued calm. From Battle Harbor to Godhavn our daily runs averaged 114 miles, a rate that made me think that for hops, after all, we had not made a bad mistake in chartering a sailing vessel for the trip to Etah. But with the engine in poor shape four days of flat calm was another and very different story, and made me at any rate begin to feel very anxious regarding the ultimate success of our voyage.

Sunday afternoon we took the
launch for a run over the glassy (42
sea to Disko Fjord, a deep, picturesque
indentation in the west side of the
island. After landing in a cove
behind a low point formed by
the basaltic columns of an old
lava flow, where we found a sim-
ple canvas "A" tent and a skin
forming a settlement called Maligiaq.
trinsic. About fifteen Eskimos
men, women and children were
grouped on the beach, some of
whom were visitors from the op-
posite side of the fjord. Their
oomniak, or large skin farming
boat, being drawn up on the shore.
Most of the natives that we have seen
thus far show an admixture of
more or less white blood, in fact
scarcely a half-breed. The adults seemed
fairly blooded or nearly so. At this
little settlement on Disko Island one

1 of the young men was blue-eyed, red-haired and rather fair-skinned, while another had wavy black hair and the features and skin of an Italian. One of the young women was rather good looking and none was repulsive in appearance.

[All topics and groups] Our engineer had his photograph taken in the act of rubbing noses with (the Eskimo substitute for kissing) the pretty one. She blushed deeply and was at first reluctant to be immobilized in this fashion, but the gift of an old, brightly colored necktie overcame her hesitancy.

The northern portion of Disko Island is high, its scenery grand. The shore cliffs are sheer, rising 3,000
eastern quarter of the crater, hence the extent of undermining in this section, although the walls are not so greatly vertical as they are on the north eastern side.

(soon to Truck Flag Station)

The manoeuvres, following on the manoeuvre preceding, were orbital with both forces having the advantage to the van. We get an attractive glimpse of the gun - crowing the road to the coast - the base of Mt. Paringa 4,165 feet and 5110 feet from the coast. Thus our only object to observe since foot and more from the sea, which (44
sulas lies the important Umanak Fjord, which is one of the chief sources of icebergs drifting down the Greenland coast. Seven active glaciers in icefalls descend from the inland ice cap into the branches of this body of water which are of sufficient importance to receive names on the Danish chart, while a half-dozen others are considered too insignificant for special designation. More bergs come out of Umanak Fjord than from Disko Bay, though the latter receives the discharge of the great Jakobshavn glacier, and icefall which is the most active ice stream in Greenland and perhaps in the world, its summer rate of motion being stated to be 150 feet (3) per day. [Ill. Northern and Disko J. and iceberg off Godthavn.]
Monday was a better day for us and at 4:30 that afternoon we had an additional 90 miles to our credit, and Tuesday was still more satisfactory, so a sum of 157 miles with a good stiff breeze bringing us to anchor at Upernivik at seven o'clock in the evening. The wonderful basalt cliffs which we first noticed on the islands in Disko Bay extend beyond Umanak Fjord to Kekertarsuak Island, thus forming more than 200 miles of the coast. The thousands of beds of lava and lapilli which make up the cliffs and mountains are striking evidence of the tremendous volcanic activity that characterized this part of Greenland during the same geological era, the Tertiary, when lavas were build-
hundreds of thousands of square miles with liquid rock of the earth's surface in Iceland, Scotland, India, western North America, the Andes Mountains and the island regions of the Pacific and Arctic oceans. North of Reptolusk Island, the rock is granite or related material and the scenery reverts to the character of that south of Disko Bay. The entrance to Lake Fjord is through a gateway that reminds one strongly of the approach to Yosemite Park. The two thousand foot vertical cliff on the north side closely resembles Sentinel Peak in profile. Not a great glacial icefall is in view thus the entrance to Sanderson's Hope, five miles south of Upernavik is one of the prominent landmarks of the
coast. Its granitic sides form a forbidding shore and rise abruptly from the sea more than 1200 feet, culminating in a peak 3467 feet above the water. Frost action has formed in the cliff, small arches like the great Washington arch at Yosemite Valley.

We stopped at Ulavivik by the advice of American Arctic travelers of experience to gather information regarding ice conditions in Melville Bay, but our experience has been that the people there knew little or nothing of value on the subject. They said that the preceding winter had been one of exceptional severity and that the bay was probably full of ice, but they had no source of definite information.
...
a little, almost land-locked cove nestled among the hills a half-
where a wheat and warehouses had been built.

mile north of town. The sea was
too rough to permit us to land the
evening of our arrival or to allow
any kayaks to come off to us, but
early the next morning the water
was calm and several of the odd
little craft were clustered about our
gangway and their occupants
were offering for barter ducks, fish,
a few articles of local manufacture
and, of all things, most unexpected in
this out of the way corner of the
world, cigars for barter or sale.
The kayaks were not so good as those
which we had seen at Godhavn, and
the skin clothing, carvings and models
of sleds and boats were not so nu-
merous or so well made. The
Sue and I arrived in Philadelphia on the 23rd. We were greeted by the Governor and his wife who had a high school education. They were both very kind and hospitable.

Soon after breakfast, I was invited to call upon the governor, Mr. A. Winterborg, whom I found to be a serious and interesting man of thirty-five years old, rather fat, speaking German fluently, but struggling hard when trying to converse in English. The Danish population of Ulster county consisted of the Governor Winterborg, his wife and two small children, his newly arrived assistant, a Lutheran pastor, his wife and two children, and the former pastor, now a very old man. The governor's wife informed me joyously that she and the pastor's wife
were looking forward with pleasure to the ensuing winter, because a young shipician was coming out from Denmark and bringing his wife on the steamer due within a fortnight or three weeks. [But was there a steamer due? Is not one of the two vessels calling at Upernivik a coasting vessel? Perhaps Rasmussen's vessel is one and the Royal Trading Co's the other. Schiöder went home on the "Cape York" in the last week of September, 1915.] Upernivik society was to be gay in the winter of 1915-1916. The Danish carpenter, Schiöder by name, who had been building the residence provided for the doctor was to go home after his year of work in the Arctic... The Eskimo population
of the settlement numbers a few one hundred souls, but most of the men were away, fishing and hunting. The Danish women find the winter terribly long and lonesome, with nine months of cold weather and the Arctic night for 90 days without sun lasting from early November to the beginning of February. The men lead a more active life than the women and do not find it so hard.

The Danes regard Greenland as missionary ground and are working hard to raise the morale as well as the physical tone of the Eskimos population. They desire less revenue from the colony than is required for the expenditures which they lay out upon the colony, but they discourage and in fact prohibit commerce
with other nations. The church at Upernivik is now housed in a new building and is fully equipped with altar, high pulpit, reading stand, baptismal font, melodion and bell, and can accommodate an audience of eighty. School is held in a room occupying the ground floor of a house near the church and has accommodations for about thirty pupils. The pastor and his wife are the teachers. Manual training in the working of bone, ivory and wood and in sewing forms an important part of the simple curriculum, which otherwise comprises reading, writing, simple arithmetic, geography and singing. The pastor and his wife are the teachers and the school year lasts the usual nine months. [Photos] The
Danish Greenland education is now slowly extending into Northwest Greenland through women who have recently married into the Smith Sound Eskimo tribe and through the establishment of missionary stations at Cape York and on Inglefield Gulf.

At Godhavn I had looked at only the exterior of the Eskimo houses, but at Upernivik I got glimpses of the interior as well. The house of the Church organist is quite pretentious, as befits his high station in the community, but he and his wife both have white blood in their veins and their abode shows the influence of Danish ideas. The building is a wooden box about twelve feet square and eight feet...
high inside, walled and roofed 157
outside with turf blocks two or more
feet thick. Entrance is gained
through a narrow, boarded passage
way about eight feet long and five
feet high facing the north. The in-
terior fittings consisted of a bedflat
form, which was used as a settle during
the waking hours, a cooking stove, a
wall cupboard and two small tables.
Daylight is admitted through two
windows that can be opened in the
west wall of the house. The inside
of the house is painted blue, and
everything is scrupulously neat
and clean. I have described
this dwelling at such length for
the sake of comparison with a gen-
true Estima or house few yards distant. This was built Pa-
the same size as the other, built of 157 stones covered over with turf but was partly excavated in the sloping bank and the walls completed and the roof built of stones covered over with turf. The entrance passage was so low that I had to crouch nearly double to traverse it, avoiding with but partial success the dog offal covering the ground. The single room contained merely the bed platform as furniture, and was heated by the open cooking-fire in the middle of the ground and either or stone floor and was lighted by means of an immovable window containing formed of six little panes of glass in the western wall. The smoke from the fire found its way out as best it might through a
A small opening in the roof. A man and his wife, his two brothers and his five children make this house their home, while in winter eight dogs also occupy the narrow entrance passage.

Several huts in the settlement look and smell worse than this one, but a few look better from the outside, while the surroundings of all leave much to be desired in the way of cleanliness. We are familiar with the Danes as a clean people, but it is evident that they have not been able to impress this characteristic generally into the habits of the natives under their jurisdiction.

Even at Uperminik the Danes grow lettuce, radishes and car-
in their homes they make roses, geraniums and other house plants grow and bloom profusely. Potatoes do not flourish, even with the greatest attention. Distill coal is used as fuel though it is not nearly so good as that from England. But it is not nearly so expensive, costing only 7 kroner ($1.89) per long ton.

An evening of victrola music on board the "Cluett" closed the day pleasantly for our new friends as well as for ourselves, and Captain Pickels having gathered what little information was to be gained regarding the summer's conditions in Melville Bay, we awaited only a favorable wind.
continue our journey a little though the breeze was strong and blowing from the north and was light, Captain Paolino got off under way by gasoline power about 6 o'clock in the morning of 12 August and, as soon as we were clear of the small islands off Upernavik, stood off W.N.W. toward the ice pack. This we sighted early in the afternoon, only twenty-eight miles from land, raising an impenetrable white barrier before us which extended in each direction as far as the eye could see. The pack is composed of countless large and small bergs jammed more or less closely together, with intervening sheets of floe and pan ice—a solid mass, to be avoided with the greatest care. The wind coming off from it was piercing,
cold, in fact we did not know—

another warm day, judged by home stan-
dards of temperature, for nearly a full
year. We began to encounter low-
lying fog and we had lots of it
during the next few weeks. Often the
sky would be clear and blue overhead
while so thick near the water that we
could not run with safety. For four
days, baffled by light head winds and
calms, we slowly skirted the edge of
the ice, sailing northeastward till
the morning of the sixteenth, when we
were off Devil's Thumb, where Melville
Bay is considered as beginning.
Then we changed our course to north-
ward and began our drift across the
ice-blocked
body of water, which was always the
bane of the whalers who used to fre-
grenet the North Water of Baffin Bay.
An incident of our journey was the containing of our first seal. Early one calm afternoon during our journey along the edge of the pack late Capt. Melvin Davis came into the cabin and called Captain Pickels to the deck.

He came back directly saying that a big hooded seal was sleeping on a nearby cake of ice. We got into his boat while I slipped off my kayak and joined him. He followed his example, and within a few minutes we were seated rifles in hand in the small boat, with Captain Conner sitting in the stern and gently paddling us towards the seal. At 100 yards we opened fire, and we certainly wasted ammunition in our excitement, for between us we fired thirteen shots at the poor beast. We got him all right and he proved to be an old bull, nine feet long from tip to tip, weighing about
five hundred pounds. The skin with a good tug. High power rifles do awful execution, the two bullets that struck the seal in the head simply pulverizing its skull. The water was alive with a multitude of little shell fish known as Pteropods belonging to the class of Planktons and swimming freely by means of wing-like appendages. These small animals form an important item in the food of the whales of these waters. As we approached land we got our first good view of the front of the continental ice cap, now at the level of the ocean and stretching along as a straight-edged, low-lying, horizontal white cloud between the blue sea and the blue sky.

We did not quite overtake the midnight sun on our way northwards, but we were in continuous
daylight for weeks. There was too much light, even at midnight, that our old cook, "Yankee Nathan," had difficulty in adapting himself to it. Soon after two one morning Captain Pickels found the cook busy making coffee in galley. When the captain asked what was going on, the cook replied "Why, sir, I'm late for breakfast now. Just look at the sun." About midnight one night I heard Nathan in the cabin calling "Charlie, Charlie! -- that boy. Why don't he answer. Charlie!" I asked what he wanted at that time of night. "I want Charlie, sir," said he, "because it's time to begin to get breakfast and that boy's sound asleep. Charlie! Get up!" But Charlie remained dead to the world and the cook finally became
convinced that the clock at least did not indicate the near approach of breakfast time yet and left the scene.

To quote from my journal for the 15th of August: 11 p.m. The evening has been clear, calm, and beautiful beyond adequate treatment with my powers of description. There are a few clouds in the sky, but the horizon is free from them. The color effects differ in different quarters of the heavens, but all are beautiful and they change rapidly as the sun sweeps along the northern horizon. Icebergs, sea, mountains, islands and coastline, fjords, distant glaciers and ice-cap look weird and mysterious in the soft twilight. The noise made by the gentle wavelets striking into the water-level grooves of icebergs
and floes is musical and plain, in the otherwise intense silence. From time to time too there comes to our ears the booming sound made by fragments of ice falling from bergs, or by bergs separating from the great glaciers in the fjords.

Nature, for the most part, seems asleep under this midnight sun just as in the darkness of our nights at home, but here and there a seal raises his head above water for a moment or a belated bird flies across one's field of vision, while Chum, our big Newfoundland dog, does not know whether to go to sleep or to play with the men whose watch is on deck. 11:25 p.m. The sun has sunk below the horizon, but wonderful purples, reds and yellows still come from
the clouds, while the brilliant orange of the sky itself illuminates the whole scene. Midnight. The warm sunset colors are central in the northern sky above the sun—royal purple in the horizon clouds, brilliant greenish gold in the band of clear sky above them, and bright light yellow on the still higher clouds. To the west, the warm colors are much in evidence, while to the east the sky is gray and cold. It seems strange that there should be this difference in such nearby adjacent quarters on the opposite sides of the arm. 12:30 a.m. The sunset colors have faded and the sunrise colors have appeared, but one wonders that they should be so much warmer and colder than the sunset hues of an hour ago, when the descending
sun was as far below the horizon as the ascending sun now is, and to the disc is barely out of sight at 1 a.m. The sun is above the horizon line and another "day" has begun.

The first two days beyond Devil's Thumb, which is an island present or filling the appearance of a tower, more than a half-mile high and less than one-third as wide, we sailed seventy miles. This was encouraging enough, considering the reputation borne by Melville Bay, and I had dreams of getting through the dread body of ice in a week's time, but matters changed the next day and six o'clock of that morning found us moored to a cake in the edge of a vast field of ice that stretched away to the east, the north and the west as
Far as the eye could see, even from 169
the masthead. It took the vessel
just four weeks to drift, sail and
cruise around the curve of the bay
140 miles by our course to Cape York,
the northern boundary limit of Melville
Bay. It was then the 4th of Septem-
ber and we ought to have turned back
at once and headed for home, since
our progress continued to be blocked
by ice floes and bergs, and young ice
was forming every night to a thickness
of a half-inch or more. But we were
anxious to accomplish the purpose
for which we had undertaken the
voyage and relieve the minds of the
men who had been watching at home
hour by hour since the first of July
for the arrival of a ship to take them home.

Turn back beyond Guadeloupe & St. Vincent.
It took us eight days to make our way with and through the ice along it to Crimson Cliff, past Panner Snow Bay and the Great Petonuk Glacier between Cape York and Cape Athol, only fifty miles, when the turn is made into North Star Bay.

In spite of our distress over the constant, recurring delays, the journey across Melville Bay was not without interest and incident. When we fairly got into the back and had need of tools with which to contend with the ice, it developed that the vessel had on board no ice anchor, no pushing poles, only one long boat hook, no ice-saws, no pickaxes, no ice-axes, no ice chisels, no dynamite, in fact we had nothing.
expressly intended for combatting the ice which a vessel, and particularly a sailing vessel, should have in order to meet the emergencies that are more than likely to arise in the course of a voyage into the Far North. To add to our difficulties, it was not safe to try to run the engine in its disabled and poorly repaired condition on kerosene and we had on board less than eight barrels of gasoline when we left Sydney. This meager supply of fuel had been sadly depleted by the inroads made upon it between Baffin Bay and Battle Harbor, at Disko Island and at Upernavik, so that it had to be carefully con-

served crossing Melville Bay for
taking advantage of favorable openings through the ice when there was no wind — and it was almost always calm, while we were in the pack! — and for getting out of the way of dangerous icebergs.

During our first few days in the ice, Chum made great efforts. He liked to trot around upon the floes and he soon learned how to go up and down the ladder leading from the ship's rail to the ice, walking the rings as well as any of us. But he had conceived a dislike to Captain Cowen without any apparent cause, the aversion seeming to date from the day when the captain doused his khaki overall trousers soon after leaving Butte Harbor. Perhaps
Chumm blamed him for the short rations without meat that have been served the dog since he had the fit on the day when we left Battle Harbour. At any rate, in the afternoon of our fourth day on the pack, Chumm without warning bit Captain Come, savagely in the hand. Captain Pickers, at once decreed Chumm’s death and delegated the mates to execute the sentence. So poor Chumm was taken out onto the ice and made to pay the extreme penalty for his singleness. There was nothing else to be done, but the event made the day sad for us all, because the dog was playful and companionable and liked by every one on board, including the victim of his spite.
Saturday, 26 August, was typical of much of the time that we spent in Melville Bay. My journal records that the day was calm, overcast and foggy, the third in succession, on which it had not been prac-
ticable to take an observation for the determination of our position.

Fourth day of being gripped fast in the vast field of ice, 300 miles from our destination and no relief in sight. Ice, ice everywhere, doted here and there with small holes and short lanes of water, no variety to be seen in any direction from the masthead except some islands and headlands rising through the white desert to the east of us. The next afternoon the captain got an observation and determined that we had advanced,
mainly by drifting, nineteen miles in four days. Sometimes the scene
changes very rapidly in these Arctic ice fields. One day, for example, it
was 26 August, we were closely sur-
rounded by iceflaps so thickly pressed
together that they formed an impassable
barrier for miles and miles. A polar
bear was sighted stalking seals a mile
or more astern of us, and Captain Pickles,
one of the crew and I started for it. I
soon turned back on account of getting
a bad fall on an upturned ice cake,
but the captain and his man kept on
after the bear. A narrow lane stopped
their advance 300 yards from their quar-
ry and the captain opened fire twice
without success and they returned
to the ship. For an hour after they
got back to the ice maintained its for.
bidding aspere and then suddenly it began to show signs of movement among the caked, within a few minutes narrow black lines were visible between the winding across the fields of deadly white and in less than a half-hour our engine was started. We moved through widening leads for several hours, until we came near a broad zone of thickly set icebergs, thousands of them it seemed, stretching seaward from Cape Melville for miles. The captain turned shoreward seeking to get around this barrier and about midnight we were in a perfect labyrinth of bergs, many of which overtopped our masts, looming high above us in most impressive fashion. The great masses of ice were beautiful under the sky.
colors of the sunsets clouds, but not finding any favorable leads along the shore and fearing that some of the bergs might come together and crush us, Captain Pickelstum ed about and motored out to sea for two hours, finally driving the vessel to a big floe. Another week of drifting, sailing and motoring carried us along forty miles nearly on our course and found us between the headlands of Cape York Bay. We were in sight of Meteorite Island and I had a chance to look through my binoculars at the place where Admiral Peary secured the great iron meteorite, which was christened Ahnighito and now is one of the chief treasures of the American Museum of Natural History.
Had there been as much ice as in 1897 as there was in 1915 the admiral could not have secured his prize when he did. Nuns hoped more were supposed to turn the eighty miles remaining to Cape Athol, where we went toward North Star Bay, about 6 o'clock in the morning of 12th September. Then the breeze that we had been hoping for, half the night died out entirely and we were drifting about in the strait between Cape Athol and Nomeholm Island. At 9 o'clock our eyes were gladdened by the sight of two boats making through the ice floes lying between us and North Star Bay. One of them was a motor boat and we thought at first that it might be the "George Bond," our Crockerland.
Expedition craft coming out 179 to meet us. Soon the two
free. From the ice, and the power boat,
jogged ahead into the open water and
made toward us. Then we proceeded
that it was not the "George Brown."
and as it approached we saw standing
on the bow a very tall white
man, with bare head, whose flowing
hair, full beard and stern clad
figure gave him the appearance of
an old-time Norse viking of the
olden times. This proved to be
Peter Freuchen, the Dane who
was charge of the Thule, North
Star Bay Station of the Cape York
Committee, which is the trading
and scientific organization whose
head is Knud Rasmussen, the
famous Greenland explorer.
and ethnologist. Everybody in Northwest Greenland from Cape York to Anorotok, Eskimos and white men alike, call Mr. Frenchen by his baptistical name, so I soon fell in with the general usage and addressed him as Peter. He is married to an Eskimo woman, Mavrama, by name, and lives very much as the Eskimos do. He has lived seven years at Umanak and is a graduate of the University of Copenhagen.

Peter gave us much aid regarding the Crocker Land Expedition staff and offered to take me in his power boat, whose name is "Ingelis," to Etah and bring back the men who could go home and as much as practicable of their and the supplies, besides a sufficient gasoline for the "Curtis" Expedition property.
through the ice of North Star Bay was the little 35-ton schooner, the "Cap York," the vessel which Rasmussen had sent out with supplies for the Upernavik station. She had left Upernavik on 14 July and arrived in North Star Bay a week ahead of us, having taken seven weeks for the journey across Melville Bay which had taken a month for us to accomplish. The "Ingerlis" is a stout clinker-built boat about 38 feet long and 9 feet beam. She was built and owned by Captain Koch, who, after he was done using her in connection with his crossing of the Greenland ice-cap, sold her to Peter. She has a small hold or locker forward, a four-birth cabin amidships and
an engine room aft, where a one-cylinder kerosene engine is installed which drives her along at a speed of about 5 knots an hour under favorable conditions.

When Peter reached the "Clout" that Sunday morning he had with new provisions from the schooner. Leaving two of the Eskimos here on board the schooner we started for Etah in the afternoon, taking Sigdlue and Hendrik as our crew, and the schooner's jolly boat as our tender. Sigdlue was one of the four Eskimos who accompanied Peary to the North Pole in 1909. In spite of his vigor and his prowess as a hunter, he is quite a dandy for an Eskimo, and likes to look well and attract favorable attention. Hendrik, who unlike the Smith Sound Eskimos has a surname, which is Olsen, be-
Longs to one of the South Greenland [83 tribes. He is a brightened Estimo, quite an aristocrat in fact, having visited Denmark and been received there by the king, who bestowed on him an "Order of Merit" decoration.

Indeed for his services in connection with the North expedition (verify). He is very polite and thoughtful and he likes to treat his friends to cigars "like Americans." He left the "George B. Cluett" with the understanding that the schooner was to follow us, if wind made it practicable.

That Sunday, what a landsman would call a perfect day. It was clear, cloudless and calm.

The North Water of Baffin Bay was free from large masses of frazil ice, the conditions were perfect for
for motor boat work and the "Clufft" could easily have made
Etah in 24 to 30 hours from Cape
Athol, if her engine had been in pro-
per repair, but also the engine
was almost broken down, it would
not run on kerosene, would
scarcely run on gasoline and
the last barrel of gasoline had been
poured into the tank while we
were off Cape Melville two weeks
before. One of the important com-
misions of the "Ingerlis" was to
bring back from Etah a supply of
gasoline from the Expedition stock
to enable the "Clufft" to get across
Melville Bay. In fact, had the
schooner's engine been in good
condition when we left Sydney,
the vessel would have accomplished
in all probability
her mission satisfactorily and I would not have been obliged to winter in the Arctic.

As I have said, the weather was superb and the North Water was free from impeding ice when the "Ingelis" left the "Cluett" for the run to Etah. The trip would have been most enjoyable, had I not been so anxious about the success of the whole enterprise.

Noruenholm Island, whose outer shore we skirted, is a bold, composed mass of the most ancient granite and gneisses against which lie the edges of red and white beds of sandstone, geologically more recent, both rocks presenting high steep cliffs to the water. Near the shore, on this side of Noruenholm Island, named for Sir John Noruenholm who helped fit out Hendrick Hudson in 1610.
rises the rugged cone-shaped Wh.- 86
envelope Rock, bicuspid, composed
of granite rock. The second and
larger island lying across the en-
trance to Wostenholme Sound is
Saunders Island. This presents a stark
contrast in appearance to Wos-
tenholme Island, being composed en-
tirely of the red and white bands of
Auroran sandstone, whose hori-
zontal in the lofty southern cliffs
but inclined gently toward the north
in the section exposed by the west-
-facing cliffs. It receives its name
from Captain Saunders whose vessel
the "North Star" wintered in the neigh-
boring bay, which is known by
her name.

The next important indenta-
tion of the coast north of Wosten-
Holme Sound is Favorite Bay, which presents an attractive vista with the Three Sisters Bees Islands stretching across its entrance. This bay presents an attractive vista and is of great interest to the geologist on account of the variety offered in the glacial phenomena displayed along its shores. Next comes Booth Sound, characterized by Fitz Clarence Rock, a lofty sugar loaf of basalt rising just within its mouth, and then Cape Parry claims attention with its high, bold front of basaltic columns projecting well into the North Water under the 77th parallel of latitude. The tidal currents churn so swiftly around this cape that the coldest weather is needful to make ice and hold it together in a surface
safe for kamatik (dog sleds) (88)
travel even in the middle of winter.

But I will not weary my readers with a detailed description of the coast of Northwest Greenland. It is bold, picturesque and interesting, but it has been described more than once.

At last, after three o’clock in the morning of Monday, 13 September, we reached Kitaa, the Eskimo settle-
ment on the southeastern shore of Northumberland Island, where Ootaq, another of Peary’s polar companions, lives. I stopped there to deliver the Victrola which had enriched the northward bound records sent back to home by the voyage of the Clagett. Admiral Peary assured me that we should not be delayed an hour on our journey, because Kitaa lay almost on our direct course and land.

It was easy, but the reckoning without...
his host, in spite of his familiarity with the Estorim character. While we were on shore delivering the machine and setting it up, the "Ingerlis" grounded on the rocks and we were kept prisoners on the island for seven hours, until the tide came in and floated the boat off again. When we left to deliver the machine and set it up, the boat, Peter told Hendrik, who serves as engineer, to push her off from shore and anchor, but the Estorim contented himself with letting the moving lines out somewhat and lay down to sleep, having been up all night running the engine. Then Peter [Mr. Octah, Wichter, Igloos] and I came back to the cliffs in the course of a half-hour, we were just in time to see the "Ingerlis" keep over on her side, breaking the
masts short off at the level of the 190
dock. My heart went into my
boots, for it looked as if the boat
were a wreck and I had momentarily
visions of being marooned there at
Niantic, midway between the "Cluett"
and the Crocker Land Expedition men
and unable to communicate with
either of party before the sea ice should
form with sufficient strength to per-
mit sledding. It looked like anaw-
ful predicament, but when we
reached the boat, we found that
the breaking of the mast had occurred
at a joint and had not injured
its root
and that she was lying easily
on the rocks. Hendrik and Sigdlw
had made the top of the mast to the
rocks in order to keep the boat up-
right, but the stick was too weak for the duty.
There was nothing for us to do but wait as patiently as we could for the tide to ebb and rise again till the boat should float once more - a matter of six or seven hours. A South Greenland Eskimo, who by name, was just establishing himself at Kiatak as a teacher missionary of the Lutheran church and had only recently finished and moved into his winter igloo, a stone and turf house. He was rather ahead of the others natives in going into winter quarters, they being still in their summer tents or skin tents. Peter and I went up to call on the missionary and his wife and I had my first experience of the inside of a Northwest Greenland igloo. The woman regaled us with some
excellent coffee, brewed over a 192
nature soapstone lamp-stove burn-
ing seal oil or narwhal oil by
means of a wick formed of dead
muskeg and decaying moss. The igloo is shaped very much
like half an acorn and its cup, which
have been cut in two lengthwise. It
is built of stones, and the spaces
between which are filled in with turf.
The ceiling or roof is constructed
of boards, whole bones and long
flat stones covered over wholly or
partly with flat stones and the whole
is covered with a thick layer of
turf in which a small hole is left
for purposes of ventilation. The
walls are lined with a tapestry of seal
skins sewed together for a wind shield.
This is kept in place through being
fastened to wooden pegs or walrus
bones built into the walls for the purpose. Above the inner opening of the tunnel-like entrance passage way a space about thirty by thirty-six inches in dimensions in the wall of the igloo is left for a window. This space is filled in with strips of seal intestine sewed together, the membrane being translucent enough to admit light sufficient for the inmates. A small hole an inch across is left in the middle of the window.

The furniture of the igloo is simplicity itself, consisting of a general or family bed-platform, occupying the inner half of the room and a lamp or stove platform at a slightly lower level on each side of the entrance. The platform serves likewise as settees,
and the floor answers for a table

during the winter, where the frozen
carcass of a seal or section of a
nowhale is allowed to stay while
the people hack pieces off from to eat,
each at his own will. A well-built
igloo, thoroughly banked up and
over with snow, is a comfortable
residence, even in the coldest wath.

e, one or two large lamp-stoves
giving plenty of light and heat.

By eleven o'clock the tide
had risen so much that the "In-
gerdie" was afloat again. We
got her off the rocks, found
that her hulk was not damaged
and we started northward
again at full speed, leaving
the mast at Kiatak to be

gotten by sledge in the coming winter.
Our route lay northward between Northumberland and Herbert Islands across the entrance to Inglefield Gulf. Along the southeastern coast of Northumberland Island, massive trap discs stand out like buttresses from the cliffs and connect with great beds of basalt which form the tops of the bluffs, while six great spacias descend the northern slopes of the island and form a striking and beautiful feature of the scenery. Inglefield Gulf presented a beautiful vista toward the east but its attractiveness had to be periscoped. Peter pointed out the spot near where Admiral and Mrs. Peary spent the winter when their daughter, the famous Snow Baby, the only white child of this bleak region, was born. The weather...
continued calm and the sea glassy and practically free from ice, but toward the latter part of the after-
noon we encountered a swell in the ocean which was heavy for a boat no larger than the "Inger-
lis".

About six o'clock, when we were still four or five hours' run from Elah, the engine suddenly stopped working and all Hendrik's inves-
tigation and effort could not discover the seat of the difficulty or start the motor. Peter, Hendrik and Sigd-
lu got into the tender and began towing the "Ingerlis" to a place of safe-

ty for the night, while I manned her tiller. It was slow, hard work for the oars-

breaking work. The tide was with us and there was howling, but the swell
made it difficult to keep the away-197-
ing motor boat from checking the mo-
mentum of the little row boat. At-
first two of the men rowed while
one steered, taking turns at the oars,
but soon Hendrik became so seas-
sick that he was of no further use.
and Peter and Sigdhu had to do
all the rowing. We were off Cape
Chalor when the engine went
out of commission, and the men
kept at their grueling work for
six long hours before we came
to anchor in the darkness of mid-
night at Sareflik near Childs Glac-
cier in Sontag Bay, the body of
water which caused the death of Dr.
Hayes's astronomer in 1861. The
evening had been beautiful, but
none of us had enjoyed it much
an account of the anxiety due to the additional delay and the precarious condition in which our breakdown placed us. We were only thankful that the calm weather had enabled us to reach a safe anchorage that night, for a strong northeasterly gale broke upon us about an hour after midnight and raged for more than twenty-four hours. The thrashing of the boat aroused us from the deep sleep into which we had fallen after the long day and the laborious journey. Hendricks discovered the seat of trouble with the engine and remedied it, but the wind was too strong to permit our rounding Cape Alexander and proceeding to Etah, now only twenty-five miles distant, hence we an
Sigdlu took our leary, fournier, 199
line ashore and made it fast to a column of basset, to supplement the holding power of anchor, which had begun to drag. While the Eskimos were attending to this task, Peter and I were having excitement enough on our account, for the dragging anchor and the as yet ineffective mooring line allowed us to swing around against a small grounded ice-berg. This gave us some anxiety for a time lest we be dashed to pieces against the berg or a big loose block on it's top face and crush us, but we finally swung free again and succeeded in hauling ourselves back into a safe position. Within a half...
hour the ice block slipped from its perch on the berg and crashed into the sea with a crash. It did not strike the place where we were lying against the ice mass, but we were glad, just the same, that we were fifty or more yards distant when it came down.

When the Eskimos had gone ashore they had neglected to remove to the "Ingeli's" three boxes which we had been towing in the tender, and now when they tried to come off to us again they found their little boat too heavy to push through the surf and they were obliged to leave their cargo on the rocks.

The wind seeming a bit less heavy, hence about 10 o'clock Peter took Sigdlu and rowed in to get the boxes, which contained some supplies.
for salmon hunting. This was a mistake
that came near costing us the ten-
der, on account of the ice-laden surf
beating heavily on the rocks, the sup-
ply of ice blocks coming copiously
from the front of Childs Glacier, near our
land. Peter and Sigdell succeeded
in landing, then the engine was started
and the tender was dragged through
the dangerous surf, her painter
having been made fast to the mooring
line. We managed to bring the
little boat alongside and Hendris
failed her out. The ice had stove
a hole in her side, but she was still
usable. There was nothing more
to be done, except wait for high
tide and less wind and surf,
so Peter and Sigdell stretched them.
While Hendrik and I did likewise on the "Dragonia."

About 2 o'clock conditions had improved so much that the men were brought off in safety, but it was not practicable to get the boxes, and an hour later, we have anchored, cut the mooring line and started again for Etah, although the wind was still high. Soon we began to encounter groups of walruses, and in the course of the afternoon we passed scores, perhaps hundreds, of these strange beasts. They were mostly females, accompanied by their young, but there were a few adult bulls in the herd. The animals are well stocked with curiosity, and these seemed
face and swam near the powerboat that they looked ferocious enough with their strong tusks, bristling backs and glaring eyes. We passed into safety the wall-like front of the great Cape Alexander Glacier, but the still fierce wind prevented our weathering the Cape itself, and we had to put back and anchor and moor the "Daisy" to the mainland shore near Sutherland Island, two or three miles from the point. It was a wretched and precarious situation, the bottom being formed of hard sandstone shelf sloping toward the sea, but we held on and managed to get a few hours of much-needed sleep. An Eskimo, like an Indian,
can always sleep when he gets 104 a chance, no matter how hard or uncomfortable his quarters may be; but anxiety and the strangeness of the surroundings made my slumber light although my bunk was all right, and about 3 o'clock I crawled out of my caribou skin sleeping bag and went on deck. Daylight was already strong, the sky was clear and the wind had almost died out, so I went below, roused my companions and urged a start. Soon we were under way, but not before Peter had congratulated me upon my birthday, he having recalled a remark that I happened to drop in Enock's igloo at Keatuk.
Cape Alexander is a bold headland 700 or 800 feet high, land of sandstone capped with a
bed of basalt projecting as a sharp
point ten or twelve miles from the
mainland. Among Arctic travelers it is noted for the strong winds and
tidal currents which prevail around
its abrupt face, while the Eskimos
dread it on account of the open
usually to be encountered there during the
which is also often tempest-tossed all winter.
forcing sledges to traverse the promon-
tory by means of two somewhat dif-
ficult glaciers three or four miles
back from the point. We rounded
the cape without incident and were
relieved to be on the last stretch of
On the north side of the Cape Alexander from which
our journey is the home of Dr. Simms-
tag, Dr. Haynes's valued assistant and
astronomer, who lost his life from shock
caused by falling into the winter sea.
near where the "Angelas" was anchored at Svalbard in the heavy gale.

About 6 o'clock in the morning the ice surrounded Storfjord from the Crocker Land Expedition Headquarters at Eीb came in sight across Fonnfjord around Vincent Island, and I could not suppress my excitement at being so near my goal. Half an hour later we came to anchor in front of the house. [Ed. note of course] Dr. Tanquary, zoologist of the expedition, was coming down the steep pathway to the landing place and Peter...
Expedition ensuing from the collar

As he was familiarly called in Nootka Sound and the

in 1915, when the first day of Sep.

not thoroughly giving me in Nootka Sound and the

called out at the top of Bremgarden

and the same year ago and found an old

the appearance of one.
At the house were Liung Green, Mr. Enblom and Mr. Allen; but
Mr. MacMillan and Jot Smithe were down at Nerko about 40
miles south of Etah hunting wal-
rus for dog food and Dr. Hunt
had started up the ice cap only
the day before on a three week trip;
after caribou. The four men
at Headquarters gave me a hearty
welcome, as soon as they recovered
from seeing me at all so late as
the fifteenth of September, and im-
mediately dispatched Noorking,
one of the Eskimos attached to the expedition,
back for Dr. Hunt's first camp
on Brother John's Glacier at the
head of Foulke Fjord, in the hope
that he might have been delayed
for some reason long enough
to receive Enblom's and my letters
announcing my arrival.

Four hours later Nooalmiingur
returned unsuccessfully, from his
trip.

Delays are dangerous in the Arctic,

hence, as soon as the staff had glanced
at their most important home let-
ters, preparations were begun for de-
parture on the next high tide, we
having been fortunate enough to
arrive at high water. Petter went
over to Provision Point, a half mile
from Headquarters, where the “Erikk”
had deposited the Expedition sup-
plies in 1913, and got the gaso-
line desired for the “Clouett” and
the kerosene and oil needed
for the return journey of the
“Ingelis”. After breakfasting
on canned bacon teams, which
were not a great novelty after two months aboard ship. I had time for an inspection of headquarters and a glance at the surrounding. The redoubt and headquarters house seemed well arranged for living, work and comfort. The large general room occupied the middle of the front and was lighted, during the sunny months, by means of a generous window on each side of the main entrance to the house. Its walls were lined with shelves for books, apparatus and provisions, while in the middle of the room was the dining and work table, behind which stood the large range for cooking and heating. Out of the sides of the room opened the four
sleeping rooms for Mr. MacMillan and his staff, two on either side.
The rear of the house was devoted to a large workroom, a store room and a photographic dark room, while above was a general attic. The house stood on a west-facing slope, and coal, dog meat and other supplies were stored in a covered gallery on the west and north sides.

(Youth Settlement - A cousin)

Friars and other distant kin
On board once for the first
High grade bus to be seen
Fridays First at the sea, but
more than expected for that day.
Not a freight train or any
Farther to the west because

200
low the level of the windows.

While the space under the front half of the main building was used as quarters for the Eskimo keepers of the Expedition. Boxes of dog biscuit and pemmican were piled up outside. One of the curious ties of the place was an Eskimo igloo built of boxes of dog biscuit, no apparent danger of starvation there.

The day was beautiful and exceptionally calm for Etah, where the wind seems to blow nearly all the time. During the afternoon the Expedition records, negatives, exposed photographic plates and Herbarium together with the men's most important personal effects were taken on
board the "Ingerik" and stored in the little forecastle and on the cabin floor where they made a pile level with the sides of the banks. This was flattened out with bales and fur clothing where three men could sleep in comparative comfort, provided they did not toss about too much in their dreams.

Eight men made a very full complement for the thirty-eight foot boat to accommodate.

We got under way at 6:35 o'clock in the evening, skirted Star Woodless Island, where we saw the little House, which Green and Allen spent several months of their fruitless effort to get wireless into communication with the distant outside world,
and stood into Harborsme Bay for the purpose of picking up some clothing from the camp where two of the men had been hunting Raves, near the location of Dr. Hayes's headquarters in the winter of 1850-51. As we approached the land we saw scores of Raves scurrying up the cliff side. Ekblaw counted 67, after a good many had disappeared from view. They looked like a fluffy wonder as the starvation company hunted for them in the Arctic. About 9 o'clock the next morning we arrived off Nette, which lies near the great Morris K. Jesup Glacier and is a favorite resort for walrus hunting. After much shouting we roused Mr. MacMillan and Small, and they came out of their tent surprised enough to see the "M-"
Gerlis" with us, particularly", I'll
me on board. Joe was the first
one to reach us, coming out in a
bad
kayak which he constructed after
his own plans and which he con-
sidered to be a great improve-
ment over the Eskimo boat. He
is a boat builder by trade, but his
substitute looked rather odd beside
the real thing as made by the natives.
St being necessary that some one
stay by the Expedition property
at headquarters, Mr. MacMillan
went
perceived at once that he was the one
upon whom the duty devolved,
especially since he had sent word
to the American Museum in
the spring of 1915 saying that he
wished to remain a year after
the return of the main portion.
By the staff in order to carry on his ethnological and archaeological work along the shores of Smith Sound and Kane Basin. At MacMillan’s request I left fort with him as assistant, for wishing to remain since he likes the life in this bleak country.

After about two hours of busy conference, we regretfully bade the men good-bye, leaving with Mac his bundle of letters, a box of rifles and ammunition and a half-box of oranges. The last was a great treat after two years’ deprivation of fresh fruits of all kinds. Our journey across Whale Sound was without incident, except that we saw much more ice than on the southward trip.
three days before and that we saw many groups of walruses in
the water and on the floes. The big fellows did not pay much attention to us, seeming to know
that we were in too much of a hurry to spend time hunting them.
It almost broke the hearts of Peter, Hendrik and Sieber not to be able
to stop and get some of the animals or even to kill them. Too much
would have been allowed to slip away to suit their ideas of what was proper. In
the latter part of the afternoon as we were running along past the
entrance to Booth Sound, whose sugar-loaf island Fitzgerald's
Rock is a prominent and
well-known landmark, the wind
suddenly became strong from the
southeast and soon a gale was raging against which we made but little progress. We five Americans were lying in the cabin, keeping dry from the dashing spray, when Peters called down the companion way in a terrified voice, "The boat is sinking." We did not know what boat he meant, but we crowded up the little passage two at a time, getting sadly in one another's way. When we reached the deck we found that the waves were swamping the tender which we were towing loaded with gaso-line. Under the mate's directions the boat was with difficulty hauled up alongside and Allen jumped in with a line around his body. Six or seven cases of gaso-line were passed up safely on board.
The power boat, however, went adrift and soon disappeared behind us. We tried to make Granville Bay, but the gale was too strong for us and we had to return to an anchorage near the entrance to Booth Sound, where we lay all night comfortably enough, though drifting snowers (small ice bergs) gave us some anxiety from time to time.

The wind was still very strong the next morning, but we got under way again soon after daybreak and skirted the coast nearly to the entrance to Granville Bay. Then we pushed out across Wostenholme Sound, the way being clear, heading for the west end of Sanraiders Island, to intercept
the "Claret," in the improbable case that she was taking advantage of the favorable strong wind to follow our course to Utah. We crossed the Sound in safety, but went no farther than the western end of the island off a gentle slope where some old ruined igloos bore token of former occupation of the land by Eskimos, for there we encountered a vast field of tightly packed ice pans and bergs which filled the space between Saunders Island, Wostenholme Island, and the mainland. Turning back, we skirted the northeastern shore of Saunders Island making for Osamanak, as the head of North Star Bay. The cliffs along this side of the island are magnificent.
in their almost vertical rise of 1,000 to 1,300 feet from the sea and are beautiful in their strong horizontal banding of red, purple, and white quartzite, an ancient, metamorphosed sandstone.

The cliffs form a great breeding place for birds. During the summer season, principally the eider or murre, and the island is a favorite resort for the Smith Sound Eskimos during the latter part of May and the month of June. They live in tupikos on the lowlying land at the western end of the island while they net the birds for food and clothing and collect eggs for food. A story is current to the effect that some South Greenlanders came to the island...
once for the purpose of getting 1/22
birds and eggs. They let them-
selves down by means of a rope to
a shelf on the face of the cliff, but
while they were at work some Unu-
nak residents who resented this
poaching on what they regarded
as their own bird preserve took away
the rope and left the intruders
to escape from their dangerous
perch as best they could. After
some days of difficult work, the
men succeeded in getting down
and they left the region never to
return or to be followed by others.

Late in the afternoon of the seven-
teenth, we reached the "Cluett" and
were more than glad to get there
safely, the wind then being on
the increase again. The vessel was
sitting with both anchors. We will nip in North Star Bay, about two miles from the little settlement known as Ulmanak, where the Cape York Committee has its Arctic station and Peter lives. We found the deck filled with Eskimo men, women and children and it seemed as if the whole population of Ulmanak were on board the schooner. Captain Pickels in fact told me that nineteen of them had spent most of the time on the vessel during the three days that the "Cluett" had been lying at anchor there and that they were a lazy, good for nothing lot, willing to eat and accept everything that was offered them and to do nothing in return. There was, however, one woman in
the party who displayed en-ergy enough to make a pair of kamiks (deadrain boots) for the captain. We learned later, I am glad to say, from experience as well as from what was told us, that this attitude of the natives was peculiar to North Star Bay, the less efficient people gravitating in Greenland, as elsewhere, to the vicinity of the white man and his trading station. The pickings there are better and it is easy to get a living by working on the sympathies of the white man and those of the energetic natives who come in on their travels or for purposes of trade. At North Star Bay matters are somewhat aggravated by Peter's open hearted, generous
nature, for he can never see any apparent distress without reliving it to the best of his ability, even at the cost of personal friction. When taxed with being too easy in his dealings with the Eskimos, he replied "But what is to do? I can not see them hungry." As a tribe the Eskimos of Northwest Greenland, as the region from Melville Bay northward along the "American route to the Pole," is called, are an independent, self-reliant, kind-hearted people, possessing some characteristics that are not excelled among the most highly civilized races or nations of the earth.

One of the visiting Franky on board the "Cluff" was old Markham, the last survivor of the Eskimo
Immigrants who came across the Smith Sound from Baffin Land region some sixty or seventy years ago and mingled with the Smith Sound Greenland natives. The old man, who was estimated to be seventy-five or eighty years of age, could not resist the temptation offered by the ship’s dietary and he overate to such an extent that he had an attack of acute indigestion and died a day or two later. The white men were surprised that the ship’s supplies should be so attractive, even to an Eskimo. The chief’s regret aroused by the man’s death seemed to be due to the fact that he had just been provided with a new kooloatuh (caribou skin coat) and superstition would prevent the
use of the garment by anyone else. It was too bad to have to waste a brand new rookerah in that way!

Supper was just over when we arrived at the "Cluett", but a few minutes work sufficed to set an ample meal before the eight hungry men who came in on the "Ingan- Dis". By this time, the wind had increased again in violence so much that the power boat could not go safely to her anchorage. Hence Peter, Hendrik, and Sigdlur were obliged to spend the night on the Cluett. Accommo-
dations were arranged for the four men brought down from Utah and by midnight all hands had turned in, glad to be housed in more soumy quarters than...
those provided by the little work-boat. We were up betimes the
next morning anxiously re-
garding the weather.

brought up from the States and to
get started for the South since baby

Louis delay now added to the
danger of our being caught in
the ice and forced to spend the
long winter in the Arctic. The gale,
however still continued with
practically unabated force, and
it soon became evident that we
could not land all the supplies
that had been brought up from
the States for the use of the Expedition,
without dangerously delaying
our start for the South. It was
already past the middle of Septem-
ber and every Louis detention
increased in geometrical progression the liability that we might get caught by the ice and forced to spend the long winter in the Arctic. Now I mourned the defects of the "Chuets" engine! Conditions at Elsa, however, did not prove to be as serious as I had expected to find them. Strict conservation of resources had been inaugurated early in 1915 and a careful inventory had been made in September. Next fall after the scope of a ship had been given up which showed that the supplies which had been furnished on a liberal scale for three years, with margin enough for even a fourth year, emergency would really be adequate for the coming year for small essentials.
the seven white men at Head. 130 quarters. They would be ample therefore for the three men left at Etah, especially when the abundance of game in that region is taken into account. With the help therefore of the Expedition men the most desirable articles were selected from my stores, including 300 pounds of sugar, which was the most crying need at Etah, and together with trading material and personal boxes addressed to MacMillan and Hunter, were made ready to go ashore with Peter as soon as the wind might permit his departure. At 5 o'clock that afternoon the "Ingenlis" ventured to depart with all the estrimos and fully as much of the cargo as it was safe for her to take.

(Continued in Martinique book.)
For Guadeloupe see other end of this book.
St. Vincent begins on eighth leaf from this end.
Continuation of "Cluett Voyage" after p. 58 of St. Vincent.
Saint Vincent.
1915.

(Guadeloupe) (Cluett Voyage)