

What Medicine Knows Today Typhoid Fever

Typhoid fever kills about 40,000 Americans annually. Like pulmonary tuberculosis, it reaps this harvest in the golden years. Nine-tenths of its victims are between 21 and 40 years old.

The time is coming when an epidemic of typhoid fever will be looked upon as a disgrace to a civilized community. Typhoid is always preventable. Its occurrence is almost invariably a proof of gross official carelessness and neglect.

In Germany, where such things are managed with unsentimental thoroughness, the disease is almost extinct. In Berlin, where it once raged violently, the death rate per annum has been reduced to little more than 2 per 100,000 of population, and these are cases introduced from the country.

In Munich, once a veritable pest-hole typhoid fever has disappeared almost entirely. In the whole of Germany, rural as well as urban, the mortality has been reduced to 1.5 per 100,000.

But in the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

Typhoid fever is caused by bad drainage and impure drinking water. The germ appears in the water supply. Pretty soon a multitude of persons is infected. Then these patients, in turn, infect a multitude of others.

The only way to stamp out the malady is to make the water supply pure and see that those who are ill are properly nursed and guarded, and so do not transmit the infection to others. All of this may be difficult of attainment, but the experience of Germany, Switzerland, and Norway has demonstrated that given intelligent official supervision, it is far from being so in point of fact.

The germ of typhoid is a minute organism called the bacillus typhosus. It was discovered in 1880 by a German named Eberth in the small intestinal

blood vessels of a man who had succumbed to the disease. Soon afterward Koch, the great German biologist, found it in the other organs of typhoid victims. In 1884 it was cultivated artificially for the first time, in a water like a water beetle. When the bacillus typhosus enters the human body—and it invariably gets in by the digestive tract—it makes its way to the intestines and there takes up its home in the intestinal walls. Two or three weeks later the invaded person loses appetite and begins to have headaches and pains in the back. A few days later the patient is in bed and helpless; and the chances of never leaving it again are about 15 in a hundred.

Typhoid fever is a self-limiting disease. This means that it runs a definite course and that medicine does little to shorten or modify the course. During the first week the patient's temperature rises gradually until it stands at 103, 104 or 105 degrees. Then, for another week, it remains high. During the third week, if all goes well, it begins to decline; and during the fourth week the patient regains strength and appetite and is on the mend.

This is the course of the malady under favorable conditions. Under unfavorable conditions, the typhoid germ burrows into the walls of the intestinal tract, breaks through into the abdominal cavity. General peritonitis follows; or the high fever, long continued, saps the strength and causes collapse. In either event the patient dies.

Years ago there were a hundred so-called cures for typhoid. Modern medicine has rejected all of them, one by one, as worse than useless. Today

the malady is combatted more by nursing than by drugs. The patient's strength is kept up by judicious feeding, the fever is reduced by ice-baths, and a desperate fight is made from the beginning to prevent the fatal intestinal perforation.

All of this treatment is best obtainable in a good hospital; therefore it is becoming more and more common to send typhoid patients to hospitals. In the home, no matter how great the efforts it is almost impossible to make conditions entirely favorable. The medicine or appliance needed in an emergency is not at hand; the doctor, perhaps, has just left; and the nurse is everything necessary is to be had at once, and expert attendance is unobtainable.

Typhoid fever, it should be remembered, is a malady of sudden surprises and alarms. The patient may seem to be progressing admirably, when, literally without an instant's warning, a crisis will come, and unless the needed help is immediately at hand, a fatal result may follow. Bactericidal treatment, indeed, is the price of life. An hour's neglect may easily mean death.

Even more important than the cure of the individual patient is the bearing upon the welfare of the community, is the prevention of further infection. Persons ill with typhoid are as dangerous to those around them as carriers from smallpox and cholera. The bacilli of the malady swarm in the patient's blood and they swarm, too, in the secretions of the body. Therefore a great effort must be made to prevent the latter from coming into contact with healthy persons.

The vessels from which the typhoid patient eats and drinks must be sterilized afterward. The bed-clothes must be washed in antiseptics. The discharges must be burned. The water used to bathe him must be treated with strong germicides before it is poured away.

The bacillus typhosus is extraordinarily tenacious of life. It will live for three months in water and for four months in milk. Extreme cold seems to have no effect upon it, for it has been found alive after 100 days of freezing. On fruits and vegetables (usually carried to them by washing in contaminated water) it will live for 30 days, and in oysters even longer. It has been found after 80 days on clothing and rags, and after three months on the soiled linen of patients. Flies are known to carry it. There are investigators who say that it is sometimes transmitted, in dust.

In view of all this, the prime importance of intelligent precautionary measures is apparent. All sick-room debris must be destroyed. All who have occasion to touch the patient must cleanse their hands thoroughly with antiseptics. Carbolic acid and corrosive sublimate are the agents employed most commonly in this war upon the germ. However great all other precautions are, all who have no business in the sick room must stay out.

If the water supply of every large city were guarded properly typhoid fever would be confined to imported cases. This is, it happens frequently, the case in London. The water supply, being under the control of the city authorities, is surrounded by the waterworks, the debris of sickrooms finds its way into the storage tanks. There, the germs from smallpox and cholera, they are running in every tank of the city's mains. The result, of course, is an outbreak of typhoid and the usual roll of deaths.

The way to avoid such an accident is to see to it that the streams which flow into the city are not contaminated. When this seems a task of hopeless magnitude, it is best to filter the entire water supply. Filtration, however, is a sorry substitute. Undoubtedly it kills the germs, but it kills all of them is grossly incorrect.

The damage in typhoid fever is not done by the bacillus itself. It is done by a toxin or poison found in its tissues. The body fights the disease, first by turning the germ-eating blood serum upon the germs, and secondly, by manufacturing an anti-toxin to counteract the toxin. Whenever a patient recovers, the latter begins automatically to make anti-toxin to neutralize it. If the blood manages to manufacture enough to do the work the patient recovers; if the toxin gains upon it, the patient dies.

This fact is the principle at the bottom of a typhoid vaccine made by Sir Almroth Wright, the great English pathologist. Dr. Wright cultivates typhoid bacilli in bouillon until they attain a healthy growth. Then he subjects them to a high temperature for a day or more. This heat kills the germs themselves, but it does not change the toxin within them.

The dead germs, each with its burden of toxin, are injected into the patient who is to be immunized. First a billion germs are injected, and two or three days later a second injection is made—this time of two billion germs.

The result is that the blood of the patient, invaded by all this toxin, begins to manufacture anti-toxin in enormous quantities. Pretty soon enough has been made to neutralize all of the toxin, but instead of stopping the blood keeps on. The extra supply of anti-toxin thus formed remains in the blood for a good while; and if the patient is exposed afterwards to typhoid infection, and live germs wander into his system, the toxin in them is overcome at once and they die. Thus the patient is protected against typhoid fever.

Other investigators—Chantemesse, McFadyen and Rowland—inject typhoid bacilli into horses and let the blood of the latter manufacture the anti-toxin. Then this blood is drawn and injected into human patients, where it pounces upon typhoid toxin

just as vigorously as if it were at home.

These two methods of fighting typhoid have won little favor in the United States—mainly, perhaps, because of the great expense of serum and anti-toxin which prevails in this country. But in South Africa and Japan they have been employed with great success. During the Boer war Dr. Wright inoculated thousands of British soldiers with his typhoid vaccine. It did not stamp out the disease entirely, but the reports of the army surgeons show that those who were inoculated were considerably less susceptible than those who were not; and that even if they contracted the disease after all, their chances of recovery were increased materially.

During the war with Russia, the Japanese made extensive experiments with typhoid vaccines. As a result there was little, if any typhoid in the Japanese army. In fact, this malady in past wars commonly killed more men than the bullets of the enemy, the value of the experiment is obvious. Within a few years, no doubt, such vaccines will be employed extensively in the United States.

The study of the reactions which take place between blood and germ has brought forth an ingenious and effective method of determining the presence of absence of typhoid fever in patients whose outward symptoms are puzzling. This method is based on the fact that when typhoid germs invade the human blood, the latter begins to produce, not only antitoxins to neutralize the toxins in the germs and leucocytes, but also a number of mysterious substances called agglutinins, whose function it is to make the germs grow sticky and gather in lumps, so to lose their capacity for multiplying.

These agglutinins appear in a patient's blood very soon after the typhoid germs first invade his body. Therefore, when they are found, it is pretty safe to conclude that he is infected and that, in a short while, the malady will appear in its more conspicuous manifestations.

The agglutinin test—called the Widal reaction, after its discoverer, made by drawing a small quantity of blood from the patient, diluting it with a culture of typhoid germs, and observing the result under a microscope. If the patient has typhoid, the agglutinins in his blood will cause the germs to gather in clumps. If the patient is not infected, there will be no agglutination in his blood and in consequence the germs will continue to swim about freely.

This test, unluckily, is not particularly accurate, for reasons too tedious to be discussed here, but it is employed, that it is pretty generally employed, as a "blood test" for typhoid.

It used to be accepted as a maxim that typhoid was a malady of large cities, that it was a disease of the poor. But recent investigations have proved the falsity of this. In many large cities of today some of the most prevalent in cities that it was once considered a disease of the poor. But recent investigations have proved the falsity of this. In many large cities of today some of the most prevalent in cities that it was once considered a disease of the poor.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

It is a fact that typhoid is a disease of the poor, but it is also a fact that it is a disease of the rich. In the United States, between 1900 and 1904, the rate in 38 registration cities was 34.8, and in the territory outside the registration area it was probably nearly 50.

The Sea Changes of Fifty Years

Fifty years ago! How short a time in the life of a nation, a mere moment in the history of the world, but in these latter days so swiftly are events

treating upon one another's heels that indeed "fifty years of Europe" is "better than a cycle of Cathay." But here, being simply concerned with such changes we need not linger over the stupendous alterations that the world has witnessed generally, passing over them all except in so far as they bear upon our subject. In 1857, the year that I was born, the world witnessed the greatest development in ocean traffic the world has ever seen, the final assertion of itself by the screw propeller and the acknowledgment by the shipbuilding world that the screw propeller was a material for shipbuilding, and passed away and that iron (ultimately steel) had taken its place.

Now, before I go any further, I wish to obviate any carping criticism by saying that I know full well that steam was applied to ship propulsion over a hundred years ago, and that the application of the screw propeller was not as the application of iron to the building of ships were both long anterior to 1857. However, I can assert without fear of contradiction that it was not until the date of the Crimean war, or just about fifty years ago, that both these epoch-making discoveries came into their own inheritance, so to speak, and some dim recognition of the gigantic part they were soon to play was generally made.

Fifty years ago steam had not even begun to assert its supremacy at sea, and the great white-winged fleets of sailing ships which thronged every ocean held gaily, even contemptuously, on their way, as not dreaming that the ungainly monsters which occasionally crossed their paths belching clouds of filthy smoke could possibly hold any menace for them. Those were the days of the great sailing ships, never since sails were first invented so splendid a display of yacht-like craft crowded the ports of Great Britain and America, and sped to and fro between their places of origin and the remotest parts of the earth. The old clumsy type of ship, never so ungainly as to sum up as a century ago, was being everywhere ousted by the new models, whose fairy-like curves did not hinder them from carrying huge cargo and whose speed at the high freight rates then being paid, made them a gold mine for their fortunate owners and gallant skippers.

In this great and really sudden development of swift sailing ships America had undoubtedly the lead, but British shipbuilders were not slow to learn and improve upon their teaching. The performances of such vessels as the "Sovereign of the Sea," the "Dreadnought," "James Beveler," "Marco Polo," and "Red Jacket" of American build were soon equalled and often eclipsed by the wonderful voyages made by the beautiful clippers issuing from Aberdeen and the Clyde, such as the "Ariel," "Thermopylae," "Maid of Judah," "Sir Lancelot," "Tatting," and "Lahloo," to quote only a few of the old familiar names at haphazard. The men who manned these ships, too, were of the very highest type, skilled tradesmen of very special kind. And, moreover, they were carried in such numbers that the work could always be done immediately upon order given and consequently sail could be hoisted and carried to the very last mile, or safety or even beyond it, and it was set again as soon as ever the slightest sign of amelioration in the weather appeared.

In the personal matters of food, accommodation, and pay, the crews were very nicely off, improvement in these directions lagging long behind the splendid development of the ship. The seaman's food almost invariably consisted of salt beef, salt pork, peas, rice flour and bluet; usually of the vilest quality for no supervisory was exercised. Water was often carried in casks or wooden tanks where it quickly bred worms and stank. Yet as three quarts per day was the allowance for all purposes even this filthy liquid was precious, and I have often been jeered at for straining the vermin out of my drink through a piece of rag or holding my nose while I drank. All this time owners were making vast fortunes, but never giving any heed to the lives of their men, because they did not or would not

know how terrible were the conditions under which those men lived.

Yes, they were palmy days for the shipping world, but it was a palmy day what I might term the aristocracy of the sea, the lower grades of ships coasters, the grimy collier coasters, were of course proportionately worse, but even they managed to make very fair individual pickings. But a vast factor in seafaring had after long and long been begun to take gigantic strides toward the walls of the world, the Atlantic steamship line, the Cunard, started a few years before, was about to subvert the iron for wood as a shipbuilding material, and the screw propeller—neat, safe, and hidden from view, and the attacks of the waves—was the vast, ungainly and very vulnerable sailing ship, which had been the mainstay of the world's shipping, was being utterly overthrown.

Now, before I go any further, I wish to obviate any carping criticism by saying that I know full well that steam was applied to ship propulsion over a hundred years ago, and that the application of the screw propeller was not as the application of iron to the building of ships were both long anterior to 1857. However, I can assert without fear of contradiction that it was not until the date of the Crimean war, or just about fifty years ago, that both these epoch-making discoveries came into their own inheritance, so to speak, and some dim recognition of the gigantic part they were soon to play was generally made.

Fifty years ago steam had not even begun to assert its supremacy at sea, and the great white-winged fleets of sailing ships which thronged every ocean held gaily, even contemptuously, on their way, as not dreaming that the ungainly monsters which occasionally crossed their paths belching clouds of filthy smoke could possibly hold any menace for them. Those were the days of the great sailing ships, never since sails were first invented so splendid a display of yacht-like craft crowded the ports of Great Britain and America, and sped to and fro between their places of origin and the remotest parts of the earth. The old clumsy type of ship, never so ungainly as to sum up as a century ago, was being everywhere ousted by the new models, whose fairy-like curves did not hinder them from carrying huge cargo and whose speed at the high freight rates then being paid, made them a gold mine for their fortunate owners and gallant skippers.

In this great and really sudden development of swift sailing ships America had undoubtedly the lead, but British shipbuilders were not slow to learn and improve upon their teaching. The performances of such vessels as the "Sovereign of the Sea," the "Dreadnought," "James Beveler," "Marco Polo," and "Red Jacket" of American build were soon equalled and often eclipsed by the wonderful voyages made by the beautiful clippers issuing from Aberdeen and the Clyde, such as the "Ariel," "Thermopylae," "Maid of Judah," "Sir Lancelot," "Tatting," and "Lahloo," to quote only a few of the old familiar names at haphazard. The men who manned these ships, too, were of the very highest type, skilled tradesmen of very special kind. And, moreover, they were carried in such numbers that the work could always be done immediately upon order given and consequently sail could be hoisted and carried to the very last mile, or safety or even beyond it, and it was set again as soon as ever the slightest sign of amelioration in the weather appeared.

In the personal matters of food, accommodation, and pay, the crews were very nicely off, improvement in these directions lagging long behind the splendid development of the ship. The seaman's food almost invariably consisted of salt beef, salt pork, peas, rice flour and bluet; usually of the vilest quality for no supervisory was exercised. Water was often carried in casks or wooden tanks where it quickly bred worms and stank. Yet as three quarts per day was the allowance for all purposes even this filthy liquid was precious, and I have often been jeered at for straining the vermin out of my drink through a piece of rag or holding my nose while I drank. All this time owners were making vast fortunes, but never giving any heed to the lives of their men, because they did not or would not

know how terrible were the conditions under which those men lived.

Yes, they were palmy days for the shipping world, but it was a palmy day what I might term the aristocracy of the sea, the lower grades of ships coasters, the grimy collier coasters, were of course proportionately worse, but even they managed to make very fair individual pickings. But a vast factor in seafaring had after long and long been begun to take gigantic strides toward the walls of the world, the Atlantic steamship line, the Cunard, started a few years before, was about to subvert the iron for wood as a shipbuilding material, and the screw propeller—neat, safe, and hidden from view, and the attacks of the waves—was the vast, ungainly and very vulnerable sailing ship, which had been the mainstay of the world's shipping, was being utterly overthrown.

Now, before I go any further, I wish to obviate any carping criticism by saying that I know full well that steam was applied to ship propulsion over a hundred years ago, and that the application of the screw propeller was not as the application of iron to the building of ships were both long anterior to 1857. However, I can assert without fear of contradiction that it was not until the date of the Crimean war, or just about fifty years ago, that both these epoch-making discoveries came into their own inheritance, so to speak, and some dim recognition of the gigantic part they were soon to play was generally made.

Fifty years ago steam had not even begun to assert its supremacy at sea, and the great white-winged fleets of sailing ships which thronged every ocean held gaily, even contemptuously, on their way, as not dreaming that the ungainly monsters which occasionally crossed their paths belching clouds of filthy smoke could possibly hold any menace for them. Those were the days of the great sailing ships, never since sails were first invented so splendid a display of yacht-like craft crowded the ports of Great Britain and America, and sped to and fro between their places of origin and the remotest parts of the earth. The old clumsy type of ship, never so ungainly as to sum up as a century ago, was being everywhere ousted by the new models, whose fairy-like curves did not hinder them from carrying huge cargo and whose speed at the high freight rates then being paid, made them a gold mine for their fortunate owners and gallant skippers.

In this great and really sudden development of swift sailing ships America had undoubtedly the lead, but British shipbuilders were not slow to learn and improve upon their teaching. The performances of such vessels as the "Sovereign of the Sea," the "Dreadnought," "James Beveler," "Marco Polo," and "Red Jacket" of American build were soon equalled and often eclipsed by the wonderful voyages made by the beautiful clippers issuing from Aberdeen and the Clyde, such as the "Ariel," "Thermopylae," "Maid of Judah," "Sir Lancelot," "Tatting," and "Lahloo," to quote only a few of the old familiar names at haphazard. The men who manned these ships, too, were of the very highest type, skilled tradesmen of very special kind. And, moreover, they were carried in such numbers that the work could always be done immediately upon order given and consequently sail could be hoisted and carried to the very last mile, or safety or even beyond it, and it was set again as soon as ever the slightest sign of amelioration in the weather appeared.

In the personal matters of food, accommodation, and pay, the crews were very nicely off, improvement in these directions lagging long behind the splendid development of the ship. The seaman's food almost invariably consisted of salt beef, salt pork, peas, rice flour and bluet; usually of the vilest quality for no supervisory was exercised. Water was often carried in casks or wooden tanks where it quickly bred worms and stank. Yet as three quarts per day was the allowance for all purposes even this filthy liquid was precious, and I have often been jeered at for straining the vermin out of my drink through a piece of rag or holding my nose while I drank. All this time owners were making vast fortunes, but never giving any heed to the lives of their men, because they did not or would not

know how terrible were the conditions under which those men lived.

Yes, they were palmy days for the shipping world, but it was a palmy day what I might term the aristocracy of the sea, the lower grades of ships coasters, the grimy collier coasters, were of course proportionately worse, but even they managed to make very fair individual pickings. But a vast factor in seafaring had after long and long been begun to take gigantic strides toward the walls of the world, the Atlantic steamship line, the Cunard, started a few years before, was about to subvert the iron for wood as a shipbuilding material, and the screw propeller—neat, safe, and hidden from view, and the attacks of the waves—was the vast, ungainly and very vulnerable sailing ship, which had been the mainstay of the world's shipping, was being utterly overthrown.

Now, before I go any further, I wish to obviate any carping criticism by saying that I know full well that steam was applied to ship propulsion over a hundred years ago, and that the application of the screw propeller was not as the application of iron to the building of ships were both long anterior to 1857. However, I can assert without fear of contradiction that it was not until the date of the Crimean war, or just about fifty years ago, that both these epoch-making discoveries came into their own inheritance, so to speak, and some dim recognition of the gigantic part they were soon to play was generally made.

Fifty years ago steam had not even begun to assert its supremacy at sea, and the great white-winged fleets of sailing ships which thronged every ocean held gaily, even contemptuously, on their way, as not dreaming that the ungainly monsters which occasionally crossed their paths belching clouds of filthy smoke could possibly hold any menace for them. Those were the days of the great sailing ships, never since sails were first invented so splendid a display of yacht-like craft crowded the ports of Great Britain and America, and sped to and fro between their places of origin and the remotest parts of the earth. The old clumsy type of ship, never so ungainly as to sum up as a century ago, was being everywhere ousted by the new models, whose fairy-like curves did not hinder them from carrying huge cargo and whose speed at the high freight rates then being paid, made them a gold mine for their fortunate owners and gallant skippers.

In this great and really sudden development of swift sailing ships America had undoubtedly the lead, but British shipbuilders were not slow to learn and improve upon their teaching. The performances of such vessels as the "Sovereign of the Sea," the "Dreadnought," "James Beveler," "Marco Polo," and "Red Jacket" of American build were soon equalled and often eclipsed by the wonderful voyages made by the beautiful clippers issuing from Aberdeen and the Clyde, such as the "Ariel," "Thermopylae," "Maid of Judah," "Sir Lancelot," "Tatting," and "Lahloo," to quote only a few of the old familiar names at haphazard. The men who manned these ships, too, were of the very highest type, skilled tradesmen of very special kind. And, moreover, they were carried in such numbers that the work could always be done immediately upon order given and consequently sail could be hoisted and carried to the very last mile, or safety or even beyond it, and it was set again as soon as ever the slightest sign of amelioration in the weather appeared.

In the personal matters of food, accommodation, and pay, the crews were very nicely off, improvement in these directions lagging long behind the splendid development of the ship. The seaman's food almost invariably consisted of salt beef, salt pork, peas, rice flour and bluet; usually of the vilest quality for no supervisory was exercised. Water was often carried in casks or wooden tanks where it quickly bred worms and stank. Yet as three quarts per day was the allowance for all purposes even this filthy liquid was precious, and I have often been jeered at for straining the vermin out of my drink through a piece of rag or holding my nose while I drank. All this time owners were making vast fortunes, but never giving any heed to the lives of their men, because they did not or would not

know how terrible were the conditions under which those men lived.

know how terrible were the conditions under which those men lived.

Yes, they were palmy days for the shipping world, but it was a palmy day what I might term the aristocracy of the sea, the lower grades of ships coasters, the grimy collier coasters, were of course proportionately worse, but even they managed to make very fair individual pickings. But a vast factor in seafaring had after long and long been begun to take gigantic strides toward the walls of the world, the Atlantic steamship line, the Cunard, started a few years before, was about to subvert the iron for wood as a shipbuilding material, and the screw propeller—neat, safe, and hidden from view, and the attacks of the waves—was the vast, ungainly and very vulnerable sailing ship, which had been the mainstay of the world's shipping, was being utterly overthrown.

Now, before I go any further, I wish to obviate any carping criticism by saying that I know full well that steam was applied to ship propulsion over a hundred years ago, and that the application of the screw propeller was not as the application of iron to the building of ships were both long anterior to 1857. However, I can assert without fear of contradiction that it was not until the date of the Crimean war, or just about fifty years ago, that both these epoch-making discoveries came into their own inheritance, so to speak, and some dim recognition of the gigantic part they were soon to play was generally made.

Fifty years ago steam had not even begun to assert its supremacy at sea, and the great white-winged fleets of sailing ships which thronged every ocean held gaily, even contemptuously, on their way, as not dreaming that the ungainly monsters which occasionally crossed their paths belching clouds of filthy smoke could possibly hold any menace for them. Those were the days of the great sailing ships, never since sails were first invented so splendid a display of yacht-like craft crowded the ports of Great Britain and America, and sped to and fro between their places of origin and the remotest parts of the earth. The old clumsy type of ship, never so ungainly as to sum up as a century ago, was being everywhere ousted by the new models, whose fairy-like curves did not hinder them from carrying huge cargo and whose speed at the high freight rates then being paid, made them a gold mine for their fortunate owners and gallant skippers.

In this great and really sudden development of swift sailing ships America had undoubtedly the lead, but British shipbuilders were not slow to learn and improve upon their teaching. The performances of such vessels as the "Sovereign of the Sea," the "Dreadnought," "James Beveler," "Marco Polo," and "Red Jacket" of American build were soon equalled and often eclipsed by the wonderful voyages made by the beautiful clippers issuing from Aberdeen and the Clyde, such as the "Ariel," "Thermopylae," "Maid of Judah," "Sir Lancelot," "Tatting," and "Lahloo," to quote only a few of the old familiar names at haphazard. The men who manned these ships, too, were of the very highest type, skilled tradesmen of very special kind. And, moreover, they were carried in such numbers that the work could always be done immediately upon order given and consequently sail could be hoisted and carried to the very last mile, or safety or even beyond it, and it was set again as soon as ever the slightest sign of amelioration in the weather appeared.

In the personal matters of food, accommodation, and pay, the crews were very nicely off, improvement in these directions lagging long behind the splendid development of the ship. The seaman's food almost invariably consisted of salt beef, salt pork, peas, rice flour and bluet; usually of the vilest quality for no supervisory was exercised. Water was often carried in casks or wooden tanks where it quickly bred worms and stank. Yet as three quarts per day was the allowance for all purposes even this filthy liquid was precious, and I have often been jeered at for straining the vermin out of my drink through a piece of rag or holding my nose while I drank. All this time owners were making vast fortunes, but never giving any heed to the lives of their men, because they did not or would not

know how terrible were the conditions under which those men lived.

Yes, they were palmy days for the shipping world, but it was a palmy day what I might term the aristocracy of the sea, the lower grades of ships coasters, the grimy collier coasters, were of course proportionately worse, but even they managed to make very fair individual pickings. But a vast factor in seafaring had after long and long been begun to take gigantic strides toward the walls of the world, the Atlantic steamship line, the Cunard, started a few years before, was about to subvert the iron for wood as a shipbuilding material, and the screw propeller—neat, safe, and hidden from view, and the attacks of the waves—was the vast, ungainly and very vulnerable sailing ship, which had been the mainstay of the world's shipping, was being utterly overthrown.

Now, before I go any further, I wish to obviate any carping criticism by saying that I know full well that steam was applied to ship propulsion over a hundred years ago, and that the application of the screw propeller was not as the application of iron to the building of ships were both long anterior to 1857. However, I can assert without fear of contradiction that it was not until the date of the Crimean war, or just about fifty years ago, that both these epoch-making discoveries came into their own inheritance, so to speak, and some dim recognition of the gigantic part they were soon to play was generally made.

Fifty years ago steam had not even begun to assert its supremacy at sea, and the great white-winged fleets of sailing ships which thronged every ocean held gaily, even contemptuously, on their way, as not dreaming that the ungainly monsters which occasionally crossed their paths belching clouds of filthy smoke could possibly hold any menace for them. Those were the days of the great sailing ships, never since sails were first invented so splendid a display of yacht-like craft crowded the ports of Great Britain and America, and sped to and fro between their places of origin and the remotest parts of the earth. The old clumsy type of ship, never so ungainly as to sum up as a century ago, was being everywhere ousted by the new models, whose fairy-like curves did not hinder them from carrying huge cargo and whose speed at the high freight rates then being paid, made them a gold mine for their fortunate owners and gallant skippers.

In this great and really sudden development of swift sailing ships America had undoubtedly the lead, but British shipbuilders were not slow to learn and improve upon their teaching. The performances of such vessels as the "Sovereign of the Sea," the "Dreadnought," "James Beveler," "Marco Polo," and "Red Jacket" of American build were soon equalled and often eclipsed by the wonderful voyages made by the beautiful clippers issuing from Aberdeen and the Clyde, such as the "Ariel," "Thermopylae," "Maid of Judah