

- (a) The temperature of the cold glass is lower than the dew point of the air, or inversely,
- (b) The dew point of the air is higher than the temperature of the cold glass.

SECTION II.—THE PRINCIPLE OF CONDENSATION APPLIED TO A SHIP'S CARGO HOLD.

6. Activity in a Cargo Hold.

Though the cargo seems to lie idly in the hold, it must be kept in mind that there is a continuous activity going on between cargoes and the atmosphere. Part of the activity may be visible, such as the condensation of moisture on cold cargo and on the cold metal surfaces of the ship's hold. Part of the activity is invisible, such as the evaporation and absorption of moisture. Besides moisture, chemicals, bacteria, insects and other destructive forces are at work.

7. Instruments for Tracing the Condition of Air and the Dew Point.

The temperature of the air can be obtained with one of many different types of thermometers. The relative humidity can be obtained directly with a relative humidity indicator called a "Hygrometer" or indirectly with a wet and dry bulb thermometer called a "Psychrometer."

8. Condensation of Moisture on Metals, Canned Goods and Similar Cargoes.

The enormous amount of cargo damage from condensation all over the world proves that the effect of ventilation on metal cargoes requires careful study. If a ship coming from cool regions enters warm weather suddenly, it will be found that, while the atmosphere rises in temperature, cold cargo of the above type in the hold will not warm up rapidly. It remains colder than the dew point of the atmosphere for a long time, perhaps for several weeks. If warm and moist air is admitted into the hold, it will contact the cold metal cargo on which moisture from the air will rapidly condense.

As long as the temperature of such cargo is below the dew point of the atmosphere, the admission of warm moist air into the hold must necessarily cause condensation on the cold metal cargoes. After the cargo has become warmer than the atmospheric dew point, the admission of warm moist air into the hold will not produce condensation on metal cargoes.

9. Reduction of Condensation on Metals, Canned Goods and Similar Cargoes.

A ship is loaded with metals, canned goods and similar cargoes in a Northern port. The hatches are battened down and the ship sails southward. After a few days warm weather is approached and the following observations are made:—

Temperature of outside air, 70 degrees; relative humidity of outside air, 58 per cent.; dew point of outside air, 55 degrees; temperature of cargo, 60 degrees. 60 degrees.

If the dew point of the outside air rises only 5 degrees the admission of such air into the hold will cause condensation on the cool cargo.

The question of whether action should be taken

before the danger point is reached must be determined by experience. It has been suggested that ventilators should be closed as soon as the dew point of the outside air is about 5 degrees below the temperature of the cargo under consideration and from then on, the holds should be kept sealed.

As soon as the cargo is about 5 degrees warmer than the dew point of the ventilating air the principle of condensation indicates that it will be safe again to admit outside air to the cargo under consideration.

If it is not possible to accurately ascertain the temperature of the cargo in question, the only guide is the principle of condensation, plus a knowledge of the temperature of the outside air. If canned goods or metal cargo have been loaded in a cold condition and warm weather is encountered at an early date, it will be known from the principle of condensation that admitting warm outside air before the cargo is warmed up, will produce condensation.

10. Mixed Cargoes.

From the foregoing it will become evident that cargoes such as metals and canned goods require different treatment in regard to ventilation as compared with moist grain, fruit, vegetables, odorous cargo, etc., carried in ordinary stowage and which require continuous ventilation.

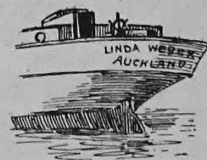
11. Condensation of Moisture on Metal Surfaces inside the Ship's Hold.

A ship coming from the tropics has its hold filled with warm and moist air. In addition to this the cargo very often is evaporative, i.e., tends to give off a considerable amount of moisture to the ventilating air. If the ship enters cold water or cold weather suddenly the metal surfaces of the hold will cool off rapidly because steel is a good conductor. As soon as these surfaces become colder than the dew point of the air in the hold, moisture will condense there. This moisture will collect on the beams and underside of the deck plates from where it will back on the cargo.

The principle of condensation indicates that under the above conditions, condensation on metal surfaces inside of the hold will form unless the warm moist air in the hold is carried away.

CONCLUSION.

The information set forth above is based largely on the Principle of Condensation and any data or information based upon practical experience from ship officers or others interested will be welcomed. Letters should be addressed to the Secretary of the Association of Marine Underwriters of British Columbia, Royal Trust Building, Vancouver, B.C.



The Impossibility of Understanding

(By Hubert Herring, Executive Director, Committee on Cultural Relations with Latin America).

It is a curious world. Here we are, 2 billion strong, increasing at the rate of 30 million each year, and living on Iowa farms, in Tokya tenements, on Russian steppes, on Argentine pampas, in African jungles, in Park Avenue apartments. We don't get along very well together.

There was a time when we had very little intercourse, and in that golden day there was slight opportunity for clashes. But the gentlemen who rigged the first sailing boat, built the first steamboat, laid rails for the first train, strung telegraph and cable wires, invented the telephone and the radio and the motion-picture film, put an end to that careless isolation.

Now we are huddled. The Amazon seeps into Fifth Avenue, and the rice fields of Siam spill over on to Michigan Avenue. It is a dreadful mess. The closer we are brought together, the more violent become the misunderstandings. If the scientists continue to think up ways of abolishing time and space, tumbling us all together like beans in a bag, the confusion will be ghastly.

There is nothing new about misunderstandings between men. There have been wars since the first parents begat the first sons. The early wars were cozy family affairs. The Phoenician Smiths borrowed an egg beater from the Phoenician Browns, who then went off to retrieve it with pikes and spears. Those first wars were relatively amicable. They can be put down in history as the precursors of intercollegiate football rather than of modern war.

Now, there lives scarcely a man who could not celebrate the virtue of understanding. If a poet, he would put it in measured lines. If a musician, he would find notes and half notes and rhythm to express his praise. But after the poems were written, the music composed, the fact would remain that it is harder for men to understand each other than it is to build bridges, erect dams, pilot airplanes across the Pacific, and weigh the stratosphere. If the observation of our tangled world leads anywhere, it is to the conclusion of the impossibility of our understanding each other.

The search after the reasons for the impossibility of understanding leads us off into the half-lights of psychology, economics, and history. It would require a brain trust with Albert Einstein, Sigmund Freud, Charles A. Beard, William James, and H. G. Wells to hunt out all the reasons why we of this cantankerous human race do not get along more amicably. However, without their help, let us set down some of the curious quirks of human nature which postpone—or prevent—that full-orbed amiability which we agree should flourish between the citizens of the world.

First, there is our exuberant delight in feeling superior. Every animal has some of it (both the four-legged and the two-legged). The cocker growls at the Pomeranian, the setter howls at the cocker, the police dog roars at the setter. It is funny in the four-legged,

and funnier in the two-legged. Races and nations, too, nurture their own theories of superiority. Philosophers, poets, dramatists, and statesmen merrily conspire together to prove that men of their peculiar parentage, their own physiognomy, and their special pigmentation have an inside track on truth and right, and should inherit the earth.

This build-up of the dogma of superiority is not new. The Jews of old, it will be recalled, had no dealings with the Samaritans. The Greeks had a word for the Romans, and the Romans had plenty of words for their "barbarian" neighbours. And in our day, how many more names have been invented by the Americans, the English, the Scotch, the Irish, the Germans, the French, the Italians, the Turks, the Japanese, the Chinese? If there are a Gilbert and a Sullivan on Mars, they have unquestionably set us to music.

Laughing at oneself is one of the most bracing of setting-up exercises. So, if some of my fellow Americans and I were to sit down together in executive session, talk frankly, without eavesdroppers, we could gain huge enjoyment from our sense of superiority. We could remind each other of that time when we met ourselves on a Czechoslovakian train, and recall the way we said, "We don't do things this way at home (meaning, we do things much better.)" Or we could think back to breakfast in London, and remember how we longed for American coffee. Or was it dinner in Paris, where we said, "Now, in Chicago we wouldn't have to wait so long?"

Our brand of superiority is not pugnacious, simply assured. We know that we were invented to rule others, just as we know that Detroit makes the best cars, that Iowa raises the best corn and hogs, and that Joan Crawford is a better actress than that German Fraulein whose name we can't remember. We are a little like the religionist who, in a burst of generous feeling, announced to the holder of a rival creed, "You serve God in your own way, I serve Him in His way." And we are always a little puzzled that the Latin American and the Frenchman cannot understand.

Our Anglo-Saxon sense of superiority has a moral undertone. If you doubt it, you can prove it by history. Haven't we a long record of trying to persuade the Fiji Islanders to wear pants, and of implanting our racial ideas of morals and manners among those to whom we sold rum and sewing machines? Some of us have even been known to covet for Nicaragua a proper appreciation of the Australian ballot, and to impose upon the Haitians a due regard for American cookery.

The second item of misunderstanding is language. Deep down in every human being is contempt for the unfamiliar. No matter how hard we try to develop imagination as to others' moods and minds, we slip into the assumption that whatever is different is inherently inferior. I recall watching one of my own countrymen in a Berlin cafe. He wanted cheese, and he talked only

English. "Cheese!" he roared at the puzzled waiter, who stood bewildered. "Cheese!" he repeated, in louder voice. "Didn't you ever hear the word 'cheese?'"

Now, of course, that gentleman was an exception—but sometimes the exception tells much. And there are plenty of us who cannot quite believe that sound sense can be spoken in Spanish or Japanese or Norwegian. And, perhaps, there are some who question whether really good sense can be expressed in the accents of Oxford English.

A third item of misunderstanding lies in differing custom. Here, again, it is the same deep-rooted contempt for the unfamiliar. I remember a hot airplane trip in Brazil. Two of us were Americans, four were Brazilians. We Americans took off our coats, the Brazilians kept theirs on, tightly buttoned. I learned afterward that our idea of comfort was an affront to Brazilian manners. The Brazilians were courteous. They did not indicate that we were going to their customs. But did they perhaps wonder at our inferior manners?

It is a familiar observation of those who have studied the ways of animals that the irregularly marked bird or mammal is often tumbled out of the nest and allowed to starve. So the human animal, reputedly far advanced from the beast, rejects as inferior those of alien custom. We know that the way to drive is to the right of the road, but those English and Swedes obstinately cling to the left. We know that the way to write is from the left to the right, but the Chinese write from right to left.

The fourth root of misunderstanding is history. Human relations do not start from scratch. We have all been indoctrinated in our schools with certain definite ideas of perfidy of other peoples. Several generations of Americans could not quite trust England because of a certain King George, and were disposed to be more than friendly to France because of a certain Marquis Lafayette. But if American attitudes have been

coloured by the teaching of history, how much truer it is of those lands so rich in history that a book could be written about each square yard?

The fifth root of international misunderstanding is economic. The conduct of nations, with all the resultant misunderstanding, is chiefly determined by their struggle for bread. The shuffling of war and conquest has created strange disparities. Some nations have ample land and raw materials. Others, with great populations, are crowded and without reserves of essential raw materials. The result is that the overcrowded seek to push out into areas where there are still room and wealth. Moral judgments and appeals to international justice do not answer their clamour.

This is not said in extenuation, in praise, or in blame, simply in explanation. It simply serves to underline the obvious truth that there can be no peace until the peoples are fed.

The wonder is not that the peoples of the earth get along so badly together, but, rather, that they manage at all. History, biology, and evolution have heaped us up together on this relatively inconspicuous planet. We speak 2,792 different languages. We live in some 70 separate nations, each with its pride, its history, its flag. We are cut off by lines of custom, habit, and religion. We are divided by historic enmities, the issues at which are obscured by time. And we are snapping at each other.

So the guardians of civilisation—we Turks, Americans, Costa Ricans, French—are confronted with two obvious facts.

The first of these is: We cannot understand each other.

The second is: Unless we find some way of understanding each other, our boasted civilisation is doomed. War, with all its modern refinements, will settle that question—conclusively.

At What Age Does Human Intellect Produce More and Better?

When is the human age more fit to produce? At what age did the Great Men produce their best works?

It is the problem discussed about 400 men taken into consideration. This main class should be divided in two categories: the men of thought and the men of action. To the former belong those men whose intellectual activity is manifested in rational processes with the purpose of joining abstract or metaphysical conceptions and to arrive to positive conclusions of the singular facts. Those men are the tragicians, the builders of religion, the astronomers, the mathematicians, the historians, the Jurists, the naturalists, the philosophers, the economists, the politicians, the writers of romances, and the poets. To the second category belong those men whose activity ends in some positive application, in activities and manifestations plastic and cnetic; these are the actors, the musical composers, the

explorers, the artists of any kind, the inventors, physicians, surgeons, the warriors, etc. Now if we consider the long list of the 400 men I took into consideration, according to their native country, and the age in which they did produce, the big averages belong to the Italians for their extraordinary work. They are, for instance, Michael Angelo, Raphael, Leonardo Da Vinci, Correggio, Tiziano, Veronese, Perugino, Dante, Botticelli, Tintoretto, Critofaro Colombo, Galileo, Volta, Macchiavelli, Cavanarola, Mazzarino, Napoleon, Cavour, Crispi, Garibaldi.

Now if we look at these men from under three points of view we must consider: (1) At what age did they start to give signs of geniality, (2) at what age did they produce their best work, (3) the length of time of their production.

Among these 400 men especially considered the

beginning of their production is about the 24 years of age.

This average has a considerable variation among different classes. It is very precocious among the musicians; they start to compose at 17 years old; the dramatical artists come soon after with the average of 18 years; warriors and jurists with an average of 22 years; poets, inventors, physicians and surgeons with an average of 24 years.

The naturalists (Linneous, Buffon, Cuvier, de Candolle, Darwin, etc.), an average of a little above the 25 years of age; the explorers the average of 26 years; the writers, astronomers, and mathematicians, the philosophers with the average of 26 years, the reformists with 28 years, the politicians and the comedians with an average of 32 years of age.

These averages are very interesting as they can prove to us that since childhood, throughout the adolescence, the emotive element of each man gets always higher until it reaches the highest point at the mature age, after which it loses of intensity giving place to superior mental elements. It explains why musicians produce good work while very young; and because in this age mind is very plastic the elements of the imagination, imitation, religion, adventure, are very developed and we can explain the reason why poets and dramatisic actors and speakers, warriors and poets, begun their career very soon. By that, the intellective components of the mind develops their production changes and at the end of that elements more positive become more prevalent and dominating. By the other side several men of science, like the philosophers and politicians do not manifest themselves until the emotive period of their life has been surpassed. Intelligence and thought are very strong in men among the 40 and 60 years of age.

The precocity is not always a desirable thing; it speeds the maturity and the decline and by some authorities it is considered as an expression of premature senility. In fact, several of these precocious children do not keep the same power getting older and sometimes it does not reach at all that of the common average. It can be explained also if we do consider that during the childhood the brain must undergo a strong effort just when its structure is more delicate and just when all the resources should point towards its plastic development. This precocity is above all very powerful among the musicians. Mozart at the age of three years gave lessons of clavicimbal to his older sister; when he was only four years old he had already composed small pieces; at the age of five years he played in public concerts; when eight years of age composed a symphony, at ten an Oratorio, at eleven an Opera. Meyerbeer at the age of five years was already a perfect pianist. Handel showed a typical musical geniality since his first year. Listz when nine years old played with a manner never seen before. Mendelssohn at nine years of age already gave concerts and at eleven years old already published magnificent sonatas. Verdi when only 14 published his first symphony. Rossini at the age of 13 had already composed an opera. Wagner published his first composition when 17 years old, and

Brahms when 20; Beethoven, the prince of all musicians, gave out his first publication when 25 years old.

Soon after the musicians, the warriors come after them for precocity. Henry the IV when 16 years old was the Chief of Army of Huguottes, when 19 years old he was King of Navarra; at the age of 44 years he had already defeated all his enemies and become King of France. Scipio, the African, already had a great name for the battle of Ticin when he was 16, at the age of 22 years was the winner of Zama. Alexander the Great was already a winner General when 18 years old, and at 26 was King and at 25 conquered all the East, and died when 32 years old. Charles the XII ended his first campaign when 18. Peter the Great at the same age organised a large expedition, when 30 years old got a big victory, and built Petersburg when 31 years old. Eugene of Savoy was a Colonel when 21 years old and when 34 won the battle of Zena. Napoleon did the Italian campaign when he was 26 and at 44 had already got infinite victories. Hannibal won at Cannes when he was 31 years old. It is important to note that the modern Great War has been conducted by old Generals. They were all old men; Hindenburg, Bulow, Mackenzen, Cadorna, Diaz, Joffre, Haig, Pasing, Conday, Grand Duke Nikolas.

On the other fields we can find also men who gave signs of their geniality very young. For this precocity we mention Ser Pico della Mirandola—knew Greek, Latin, Caledonian, Arabic, and Hebrew when a child. Mirabau published a book when he was ten years old. Stuart Mill when he was eight years old read Greek and started to study the philosophy when he was 12 years old. Dante composed a sonetto when 10 years old. Tennyson wrote a poem, still a child, and likewise Metastasio. Galilec at the age of 19 discovered the isocronism of the pendulum. It is more hard to determine at what age the Great Ten finished their best work, because not always is it easy to say which one is the best of their masterpieces. We all say that the Holy Comedy is the masterpiece of Dante and the Lost Paradise that of Milton; Faust that of Gothe, Don Quixote that of Cervantes, Eneis that of Virgil, the Novum Organum that of Francis Bacon, and that the name of Wellington is tied to the Battle of Waterloo. But for some people, and they form the majority, a special study is required to say what is the work or the action which constitutes the fastigium of the personality. According to that the average for the men of action is of 47 years for the best production and 52 for the men of thought. For the mathematicians of 41, writers and poets and inventors 44, explorers and warriors 47, musicians and actors 48, artists of any kind 50, reformists 51, physicians and surgeons 52, astronomers 58.

However, the average of the age in which great men composed their best work is of 50 years. Such an average should be more high if we do consider that several of them died when very young and they had no time to produce something else (Raphael, Byron, Chopin, Shelley).

The length of activity in the 400 men studied is

of about 40 years; 39 years for men of thought, 41 for those of action. The shortest length belongs to the poets with the average of 33 years. Explorers, reformists, with 35, warriors and philosophers with 37, meniticians with 38, musicians with 41, artists with 42, historians with 43, jurists with 44, naturalists with 45, surgeons and physicians with 46, astronomers and mathematicians with 47, inventors with 48.

Mind is still productive at the old age. Handel wrote an Oratorio when 68. Meyerber composed the *Africana* when 69; Galileo discovered the telescope when 73; Kant wrote *Metafísica* and *Atropolia* when 74. At the same age Tintoretto painted the *Paradise*, and Verdi *Otello* at 80, Falstaff. Bismarck left his charge of the Reich forced by the Kaiser when 75, and at the same age Crispi got the Presidency in Italy. Victor Hugo wrote the "History of a Crime," when 78, and at 80 wrote "Torquemada." Hindenburg became President of the Reich when 79 years old, and at the same age Clemenceau in France, just when France crossed the worst period. Cato started the study of Greek when

80 and Plato to read Latin. Socrates started to study music at the same age. Gladstone became Premier for the fourth time. Voltaire published a tragedy when 80 years old. Dandolo became Doge of Venice when he was 84 and lived as such until the age of 97. Newton still worked when 83 years old, and at the same age Spencer died with pen in hand. Moltke when 88 was still in charge of the German Staff and Michael Angelo still painting.

The lives of the great men show that mentality is increasing in power getting old until the strongest power is about 50 years of age. Generally speaking it is at this time that geniality gives more and better. Youth gives brilliant works also, which form only a hope; old age can produce more and better. The best point is given at the mature stage. This is the best age for any activity in the human fields. Maturity gets always a triumph over the inexperience of youth and over the decline of old age.

—BY A TRAVELLING MEDICO.

The Sugar Trade and the Port of London.

From Sugar Cone to Cube: When Bullock's Blood was used: Modern Methods: A Visit to a Riverside Refinery.

(Extract from the P.L.A. Monthly.)

The mists of history have lonce since closed over the origins of sugar refining, but sweetmeats have been known in the East from time immemorial and it is there that the first attempts at crystallising cane syrup on strings were made. The first recorded manufacture of sugar cones was practised in Venice in the thirteenth century, but similar methods were probably employed by the peoples of the East at a much earlier date. The industry was introduced to London from abroad in the sixteenth century and the secret was jealously guarded by the foreigners who understood the process. The methods of these sugar bakers remained very primitive for several hundreds of years, and the real development of the refining industry to its present high standard of scientific efficiency only took place during the last 125 years or so.

Refined sugar may be roughly defined as raw sugar which has been purified by being dissolved in boiling water and then re-crystallised. To-day, the sugar which leaves the factory is guaranteed 99.9 per cent. pure, and refining operations are carried out under the most hygienic conditions which contrast vividly with old-time methods.

Raw sugar supplies used to be brought to London by fast sailing ships mainly from the West Indies, and after river thieves, and more often than not, the crew of the vessel had taken their toll, the hogsheads found their way after some delay to the sugar houses, most of which were situated in Whitechapel and the Commercial Road. The heavy wooden barrels were broken open and their contents poured into big pans and boiled

with water over open fires. The next step was to add a certain quantity of bullock's blood, the albumen of which caught up some of the impurities in the sugar and made them rise to the surface where the scum was scooped off. After this process had been repeated a few times, the liquid was strained through wicker baskets lined with thick woollen cloth and boiled again in copper pans until crystals began to form.

Sugar workers armed with large scoops dipped them into the semi-crystallised *massecuite* and filled it into conical moulds of earthenware or steel. Another man gave the contents of the moulds an occasional stir with a hook and they were left to stand until the next day. When the sugar in the moulds was cold they were removed to another room and set in jars. The cloth plug which stopped the hole at the end of the cones was removed, and the opening cleared with an instrument known as a pin. The molasses gradually drained through this hole into a jar beneath and a thick sugar solution was poured on the top of the cone to wash out the remaining syrup. The un-crystallised mother syrup which drained into the jars was returned to the boiling room and treated again. The hard loaves were taken out of the moulds, dried, the discoloured tips and bases cut off, and the cones wrapped in blue paper and delivered to the grocer who chopped them up and sold the lumps and dust separately.

The dangerous open fires in the old sugar houses caused many big fires in the East End, and towards the middle of the nineteenth century various methods