RECENT SCIENTIFIC DISCOVERIES

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THE OREGONIAN'S HOME STUDY CIRCLE: DIRECTED BY PROF. SEYMOUR EATON

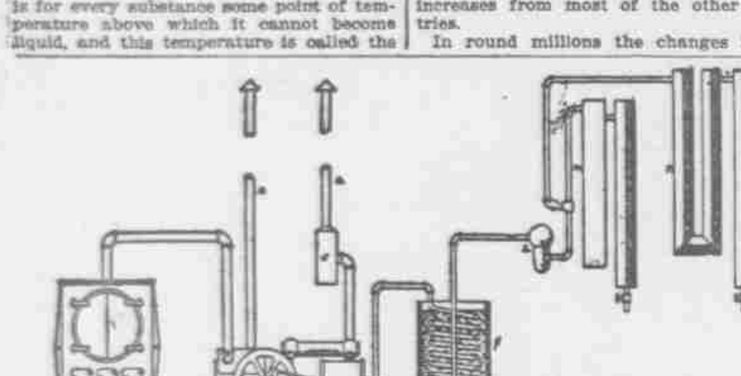
Note.—These papers on Practical Science have been prepared for The Oregonian's Home Study Circle by Prof. William J. Hopkins, of Drexel Institute.

I.—LIQUID AIR.

(Continued.)

Critical Temperature.

Of the substances familiar to everybody, some occur, under ordinary conditions, in the three states of gas, liquid and solid. Water, for example, under the usual pressure of the atmosphere, passes into steam at 100 degrees centigrade or 212 degrees Fahrenheit, and freezes at 0 degrees centigrade or 32 degrees Fahrenheit. If the pressure is increased, the boiling point rises, and if the pressure is lowered the boiling point falls accordingly. The pressure and the temperature must both be taken into account. If the temperature is kept high, as in a steam boiler, a greater pressure must be exerted to maintain the water in the liquid state, and if the ordinary temperature were, on the average, 400 degrees centigrade higher than it is, water would be known to us only as a gas. That is, steam at a temperature above 358 degrees centigrade, or about 67[illegible] degrees Fahrenheit, cannot be changed to liquid by any pressure, however, great. The researches of Andrews showed clearly that a similar state of things exists for every substance. That is, there is for every substance some point of temperature above which it cannot become liquid, and this temperature is called the



TRIPLER'S APPARATUS FOR THE LIQUIFICATION OF GASES.

"critical temperature." His most instructive experiments were made with "carbonic acid gas," or carbon dioxide, which has a critical temperature easily reached. The first step, then, in the liquefaction of any gas must evidently be to reduce its temperature below the critical point. Then, and not before then, will pressure become effective, in reducing it to a liquid. Evidently, also, any gas will be easy or di cult to liquefy, according as its critical temperature is high or low. Oxygen, whose critical temperature is 118 degrees below zero, centigrade, resisted all efforts at liquefaction for many years; nitrogen, with a critical temperature of —146 degrees centigrade, was still more refractory, and hydrogen, whose critical temperature has not been exactly determined, had to be cooled to about 235 degrees, or more, below the zero of the centigrade scale before it yielded.

The attainment of these extremely low temperatures was a matter of great difficulty, and was accomplished only gradually, through years of experiment. The means upon which chief reliance has been placed until recently is the heat change occurring when a substance which melts or boils at a low temperature is allowed to change from the solid to the liquid or from the liquid to the gaseous state.

Heat Changes in Melting and Boiling.

When a solid is melted heat must be continually supplied to it until the melting is completed. This heat is used in doing the work of separating the particles from the close bonds which make it a solid. It produces no change in temperature, and is therefore called "latent" heat. The use of ice in drinking water is a common illustration of this action, or the freezing of ice cream by the melting of a mixture of ice and salt. In the latter case part of the necessary heat is supplied to the melting mixture by the cream, which is frozen, the freezing point of the cream being higher than the melting point of the mixture.

Similarly, when a liquid is changed to a gas, a steady supply of heat is necessary, much greater than is needed to melt the same quantity of the substance. It is possible to evaporate water so rapidly under a reduced pressure that the water itself is frozen. The heat is used in work at a rapid rate, and is taken from the body of water which is evaporating. Small portions of substances which are usually gaseous have been solidified in this way.

By means of this action, and by a proper choice of substances, very low temperatures have been produced. The method is still used and must continue to be. In the past it has been an expensive method because the substances which were used as cooling agents were themselves liquefied or solidified with more or less difficulty. It is not necessary, however, that a substance should be in the liquid or solid form to produce a cooling effect. A gas may be made to cool itself.

Heat Changes in Compression and Expansion.

Everybody who has ever pumped up a bicycle tire with a hand pump knows that the compressed air is hot. The work done upon the air by the pumping increases its store of heat and raises its temperature. If the air thus compressed is allowed to escape into the atmosphere, it has to push away the outside air, doing work upon it, and is cooled in the process. Moreover, if the compressed air has been allowed to cool to the ordinary atmospheric temperature before it is released, the issuing jet of expanding air will be felt to be distinctly cold. This is the action upon which the modern "regenerative method" is based.

This method is used on a considerable scale, chiefly by three experimenters, Linde, in Germany, Hampsin in England and Tripler in America. As Tripler's operations seem to be the most extensive, as well as the most interesting to us for other reasons, his method will be described so far as it is publicly known. It is almost absurdly simple. There is an air compressor operated by steam power, coils in which the compressed air is cooled to the temperature of the water running over them, and a "liquefier," as it is called, from which liquid air is drawn by the gallon when the plant is in operation.

The air is compressed three times, with cooling between: first, to about 60 pounds above the atmospheric pressure, then to about 400 pounds, and last, to 2500 pounds to the square inch. The dust is filtered from the air before it enters the compressor, and there is another separation at the highest pressure to take out the last traces of foreign matter. The air at 2500 pounds pressure and at the temperature of the cooling tanks then passes to the liquefiers, of which there are two. Just what the construction of the liquefiers is is not publicly known. Their essential parts are a long coil of copper tube surrounded by a cylinder, which is thoroughly wrapped in insulating material. The compressed air passes through the copper tube, and is released at the end by means of a needle valve, said to be of some particularly advantageous design. At this point it expands to about the atmospheric pressure, and is very greatly cooled in the process. This expanded and cooled air then passes backward over the coils of pipe and escapes, cooling the compressed air within, which, in its turn, expands at the valve, and is still further cooled. The process is, therefore, progressive and cumulative in its cooling effect, and the lowering of temperature at the release point soon becomes so great that part of the air liquefies and collects in the lower end of the liquefiers, from which it can be drawn off like so much water by opening a tap.

Not the least wonderful thing about it is that this liquid air, at a temperature far below any of which we can have an adequate conception, is handled in apparently the most careless fashion without injury, poured about like water, and transported hundreds of miles in open buckets.

Note.—The study of "Liquid Air" will be concluded next Tuesday.

IMPORTS OF THE NATION.

Largest Increase of the Year Is From Asia.

The imports of the United States dropped off very much in 1898 as compared with the preceding year, and more than recovered in 1899. We may regard the imports of 1898 as abnormal, and the imports of 1897 and 1899 as indicating approximately the progress of our import trade. The increase of 1899 was a little less than 8 per cent over 1897. But the imports from Europe decreased more than $5,000,000. There were substantial decreases from England and Germany, but increases from most of the other countries.

In round millions the changes in our import trade by geographical divisions is as follows, comparing 1899 with 1897:

	Decrease.	Increase.
Europe	5	..
British North America	4	..
Other North American	..	26
South America	12	..
Asia	..	43
Oceanica	..	6
Africa	..	2
	21	77
Net		56

The imports from the leading European countries for the two years compared were as follows:

	1897.	1899.
United Kingdom	$159,002,286	$142,221,497
Germany	98,062,278	89,579,339
France	66,730,631	70,404,908
Italy	20,165,602	26,459,351
Switzerland	12,692,809	16,288,947
Holland	13,782,795	15,278,069
Belgium	13,901,545	11,733,802
Austria-Hungary	7,069,747	8,064,489

From other parts of North America than British the imports were as follows:

	1897.	1899.
Central America	$ 8,981,227	$ 9,305,079
Mexico	19,850,098	24,625,000
West Indies	32,794,304	52,739,219

There was an increase of about $4,000,000 from the British West Indies, and over $1,000,000 from Puerto Rico, but the largest item in this increase was the growth of imports from Cuba from $16,-223,456 to $29,619,755. The imports from the leading countries of South America show the following changes:

	1897.	1899.
Brazil	$65,928,850	$59,580,868
Argentina	10,888,561	5,597,373
Venezuela	8,556,569	5,669,925

The imports from Chile, Colombia, Ecuador, British and Dutch Guiana and Peru increased. The amounts are not very large, but in some cases the ratios are considerable. The imports from Uruguay fell off more than one-half. There was no particular change in the imports of hides and skins from South America, but the imports of wools of the first and second classes from South America have fallen off very heavily.

The largest increase of imports is from Asia, and is due chiefly to the increase from the British and Dutch East Indies. From these two groups the increase was from $36,376,814 in 1897 to $70,694,720 in 1899. The import of raw sugar from the East Indies increased from $9,899,194 in 1897 to $30,636,469 in 1899. But there was an increase of over $1,000,000 from China and nearly a million and a half from Hong Kong, and an increase of more than $6,000,000 from Japan.

The increased imports from Oceanica were due to the increase from Hawaii, from $15,311,685 in 1897 to $22,188,206 in 1899; the imports are almost exclusively sugar. There was a decreased import from British Australasia, except Auckland and Fiji; the import from the Philippines increased moderately, and from other points in this group the imports are trifling. The largest item in the increase of imports from Africa was an increase of a million and a half from Egypt and small increases from British Africa, and Africa not classified.

The imports are only partially classified by countries from which they are imported. This is done in great detail for fiscal years, the report for 1899 not yet being issued; we are using here the preliminary report for the calendar year 1899. The current importation last year was nearly $3,000,000, and almost two-thirds of it came from Germany. All the chemicals and drugs imported amounted to $48,247,047, but the sources of supply are not designated. The small amount of coal imported comes almost entirely from the British provinces. Of the $5,249,871 worth of cocoa, $1,867,810 came from the British West Indies and $2,093,023 from South America. Most of the remainder came, as many imports do, not directly from the country of production, but from a European port. The coffee imported last year was valued at $56,058,380, distributed as follows:

Brazil	$36,286,817
Other South America	6,255,630
Central America	5,244,797
Mexico	3,026,424
East Indies	2,152,974
Other Asia and Oceanica	811,334
West Indies	866,456

The raw cotton imported was worth $5,608,396, of which $54,816,008 came from Egypt and $1,404,432 from the United Kingdom, whether Egyptian or Indian is not designated. Only $500,000 worth came from Asia and Oceanica. Of $8,000,000 worth of cotton cloths, more than three-fourths came from the United Kingdom. The other manufactures of cotton were valued at $28,498,402, and the chief sources of supply were as follows:

United Kingdom	$8,308,210
Switzerland	8,137,630
Germany	7,180,000
France	4,192,848

The earthenware, stoneware and china imported slightly exceeded $8,000,000, over a third of which came from the United Kingdom, over a quarter from Germany, and nearly a quarter from France and Austria-Hungary together. Of flax the import was nearly $1,500,000, almost all from Europe; of jute $2,750,000, mostly direct from the East Indies; manila, $6,-500,000, not quite two-thirds direct from the Philippines, and nearly one-third by way of England, and sisal grass over $8,000,000, almost all from Mexico.

Of more than $6,000,000 worth of furs and skins, undressed, more than a third came from England, nearly a third from Germany. The hides and skins and principal sources are as follows:

Value of all	$51,137,659
South America	10,674,348
East Indies	6,984,030
United Kingdom	6,685,205
Other Europe	16,732,174

The crude rubber was valued at $34,-219,019, more than half of which came direct from Brazil, but over $15,000,000 came from Europe. The iron and steel manufactures, amounting to nearly $16,000,000, are not classified by countries. The raw silk was valued at $42,776,678, almost half from Japan, about a quarter from China and a little less from Italy. Of the manufactured silks, valued at $27,886,693, the chief sources of supply were:

France	$ 13,193,296
Germany	4,988,513
Switzerland	3,986,015
Japan	2,246,743
United Kingdom	2,564,764

The raw sugar imports were as follows:

Value of all	$107,137,769
East Indies	30,636,469
Hawaii	21,717,480
Cuba	17,746,966
Germany	10,700,153
British West Indies	5,825,818
Other West Indies	6,755,109
South America	6,231,062
Africa	3,782,902
Austria-Hungary	2,030,032

The tea imports were worth almost $11,000,000, nearly half of which was from China, a little less from Japan, and only $500,000 worth from the East Indies. The tobacco imports were valued at $11,654,-893, nearly $9,000,000 from Cuba and over $3,500,000 from Holland being Sumatra leaf. The wines were valued at $7,160,007, of which $4,622,796 came from France and $1,171,717 from Germany.

The imports of wool were valued at $11,659,644. Nearly half of it is put down as coming from the United Kingdom. Of the manufactures of wool, carpets were valued at $3,272,415, more than half from Continental Europe; cloths, $4,584,394, more than two-thirds from the United Kingdom; dress goods, $5,460,104, as follows:

United Kingdom	$2,386,761
France	1,889,400
Germany	1,162,665

TAXES FOR THESTATE.

The County Judge of Linn Favors a Per Capita Basis.

ALBANY, Or., Feb. 23.—(To the Editor.)—The vexatious question of equalizing the assessed valuations of the various Counties of the State seems to be up once more for discussion. It is, indeed, a difficult problem to solve, and I question if human ingenuity can devise any plan or system equitably to equalize values between Counties on a property basis. Many were the criticisms, censures and even vituperations showered upon the late State Board of Equalization for what was deemed the injustice of its findings. It, indeed, had a burdensome task—one far beyond the ability of ordinary man to accomplish satisfactorily under the law.

The law provides that, for purposes of assessment, lands tillable and nontillable shall be segregated. This provision of the law was violated, and many Counties sent in rolls with lands listed all in one column, unsegregated. How on earth could any board intelligently compare values of tillable and nontillable segregated lands with tillable and nontillable lands assessed together. Again, how can any board intelligently compare the town lots of Linn with those of Multnomah County? It simply cannot be done.

The assessment law provides that all property shall be assessed at its true cash value. We all know it is actually assessed at less than one-half of its value, with the growing disposition among Assessors, since the abolishment of the State Board of Equalization, to vie with one another in disregarding the law in this particular, that their County may escape its reasonable, just and equitable proportion of the State tax. Some means must be devised so that it will be impossible for one County to lessen its assessed valuation in the sum of $11,000,000 in one year.

Assuming the risk of being deemed presumptuous, I suggest that the next Legislature repeal all the present laws relating to the State's raising revenue from the various Counties, and enact a law providing for paying State tax upon a per capita basis. In June we shall have a United States census taken, and upon that enumeration, let the Legislature fix its levy for each County (or delegate the power as at present, to the State board) at $1 per capita, or such sum as will be found necessary to raise revenue for annual expenses of the State.

This, system will absolutely eliminate the mooted and vexatious question of equalizing values between the Counties. To my mind this plan appears perfectly simple and equitable. If under this system any of the Counties desire to raise or lower their assessment, it is no one's business but their own; but it will not enable them to shift their state burden onto the shoulders of neighboring Counties.

I have never heard the system in use in this State for the distribution of the irreducible school or County 5-mill fund objected to in any particular. Its distribution is absolutely just and equitable. Yet it is substantially the plan suggested above; the County pays to the State its tax on the basis of all its population; the State and County pays to the various school districts upon a per capita of persons between the ages of 5 and 20 years.

Some will possibly urge that, as the United States census is taken only at each decade, the population will increase or shift in localities to such a degree as to make this base inequitable. I believe there would be nothing in that argument. Population in a State like ours is quite stable at its present ratio of distribution. Even if that were not true, a State census is taken each five years after the United States enumeration, which in the wisdom of the Legislature could be used as a basis for levying the annual tax on each County. GEORGE D. BARTON.

The Holy Well.

Newcastle (England) Chronicle.

Now that Holywell street is about to be removed attention is being given to the site of the well from which it derives its name. Tradition fixed the well beneath the old Spotted Dog Tavern, which was pulled down in 1864, after standing for two centuries; but the late George Augustus Sala was able to show that the well beneath that house had no claims to be regarded as holy, being a very commonplace affair, which had long been dried up.

In 1877, however, a builder making repairs in the basement of one of the houses between the Strand and Holywell street found a well about seven feet underground, the water in which, some 20 feet below the surface, was remarkably pure and sweet. This is believed to be the holy well, and when the property is pulled down an attempt to trace it is to be made. Probably it is supplied by the same spring which feeds the old Roman bath, nearly opposite on the other side of the Strand.

A Substitute for Cork.

New York Tribune.

Phellosene is the name given by a French inventor to a substance he describes as artificial cork, and which may be used for all purposes for which cork has hitherto been found needful. It is an analogue of celluloid, and consists of cork bark ground to an impalpable powder and agglutinated by a solution of nitro-cellulose in acetone. It contains about 10 to 12 per cent of nitro-cellulose, and is said to be a trifle, if anything, more combustible than cork under the ordinay condit'ons.

Editors at New Orleans.

NEW ORLEANS, La., Feb. 26.—Thousands are pouring into the city. Seven hundred newspaper people are here, and the Oregon delegation's headquarters are crowded. The convention opens Thursday.

IS HE LARGE ENOUGH?

THE PRESIDENT IS NOW "UP AGAINST IT," INDEED.

He Has Reached the Parting of the Ways on the Dogma of Protection.

The President, says the New York Times, in a striking article, has come to the parting of the ways with respect to the dogma of protection. His position upon it has changed amazingly within the last four years. Then he tried his best, so long as he could with safety and even a little longer, to make upon that superannuated warhorse his campaign for the Presidency. While everybody else was thinking about the currency, he kept on talking about the tariff. Even when it was clearly shown to him that from every point of view, including the campaign fund point of view, it was the gold standard and not the tariff that was the winning issue, he clung with a simple and pathetic fondness to the belief of his childhood. His conservatism denoted adherence rather to a religious dogma than to a political opinion, and amounted to what Emerson describes as an intellectual "prehensility of tail." The campaign was half over before he could be induced to give the slightest aid and comfort to those voters who desired to support him as the hesitating and reluctant candidate of sound money, but who were disgusted by the thought that their votes would be counted for McKinleyism and Dingleyism.

Even after he had been elected so clearly and unmistakably without reference to the tariff, he could not prevent himself from keeping on talking about it as the source and fountain of our National prosperity, and even acting, against the clear interests of the country, in obedience to his belief. "I was born in the wilderness of Christianity," said the 18th century freethinker, "and some of the briars still hang about me." It was doubtless due to his pathetic delusion about the sacrosanctity of the tariff, ably played upon by the Russian representative at Washington, that we owe the abandonment of our clear National interest by the Administration when Great Britain made her stand in defense of our interest as well as her own. "If we join the demand for the open door in China," we can imagine the President saying: "What shall we say for ourselves when it comes to a demand for an open door in the United States?" And so Mr. Day issued that amazing announcement that the interests of the United States were not concerned in the controversy between the powers in China, which Mr. Hay, two years later, had so much trouble to undo and won so valuable a diplomatic victory by undoing.

And then came the war and the consequent expansion, and the President had to recognize the great truth that circumstances alter cases, and to make the fatal admission that the tariff was made for man, and not man for the tariff, that protection was not a sacrosanct dogma, but a human invention, subject to error and liable to change. There was no citizen of the Union upon whom a greater mass of evidence would have had to be brought to bear to induce this change of heart, and to make him confess by actions that he had been, in point of fact, "a Bourbon suckled in a creed outworn." It would have been asking too much of him to confess it in words, but he has confessed it by silence as well as by actions. He has found it practicable to write a message to Congress without paying the once sacred tariff the cold tribute of a passing glance, and he has found it practicable to recommend taking down the tariff fence altogether between these States and the Island of Puerto Rico.

It may be that the quarter of the Dingley rates proposed to be charged upon imports to Puerto Rico and exports from it, will meet the immediate commercial needs of the Island, as well as the abolition of the tariff altogether as to that Island. But the President has committed himself to the advocacy of the latter course. Any temporary relief he may secure for himself by yielding to protectionist pressure will be at the cost of far greater trouble to him and to his successors. Sugar from the Philippines must not be permitted to come into competition with Hawaiian sugar. It must not be permitted to come into competition with Louisiana sugar. It must not be permitted to endanger the success of the experiments of any experimental agriculturist who is fiddling with beets in Nebraska or sorghum in Iowa, or maple sap in Vermont. The President has gone far enough now to show that he recognizes that the protectionist jig is up. It was ended by the results of the war with Spain. The question raised now is for him not a question of brains, but a question of backbone. Has he the courage to act upon his own intellectual perceptions? Does he think that this is a convenient season to advocate the strengthening of the protectionist wall? Does he think the American people will continue to recognize as an infant "mewling in the nurse's arms" the Carnegie Works, competing with its rivals the world over on equal terms, and dividing 100 per cent a year of profits? Does he think they will listen with patience to that other infant, the shipbuilding industry, squalling in one breath that it can build ships, as it can, in competition with the world, and whining in the next that, in addition to a protection of absolute and avowed exclusion of the competing product, it shall be stayed with subsidies and comforted with bounties? Does he think they will stand the infamous Hepburn report which proposes that we shall avow ourselves the enemies of commerce and of the human race by managing a great ocean highway as our private lane and taxing the ships of all the world in order to pay the cost of carrying our own ships through free of charge? To yield now, by backing down from the stand he has taken in respect to Puerto Rico, were to deprive himself of the power of resisting any one of these ridiculous or disgraceful things. It were to prove the truth of Burke's saying that "a great Empire and little mind go ill together." It makes a difference to all of us, and it makes a great difference to the President himself whether in this crisis he shows the courage of his perceptions, the strength to insist that, the moment we became a world power, we bound ourselves to cast aside the swaddling clothes of our industrial childhood.

BIG STORE TAX INVALID.

Department Merchants Win in Missouri Supreme Court.

Jefferson City, Mo.—The Supreme Court has declared the department store law, passed by the last Legislature, to be unconstitutional. It holds that the law is class legislation; that the act is incomplete, and is not a law, and does not constitute a rule of conduct, and that the act imposes an occupant tax as a license to do business.

The so-called "anti-department-store" law was enacted by the last General Assembly, and, there being no emergency clause, it took effect on September 13, 1899. Its avowed purpose was to apply discriminating taxation. The act was entitled "an act to regulate business and trade in cities having a population of 50,000 or over."

The act made a classification of goods in some 70 classes, and these classes were further combined in groups. Any merchant in a city of over 50,000 inhabitants who employed over 15 employes in retail business was compelled to take out a separate license for each group or class. This license was not to be less than $200 or more than $500 for each group. In the first draft of the bill in the Legislature it was attempted to make this license $1000, but this was amended.

As the bill was first drafted it provided for the fixing of the license and its collection by the license authorities of each City, but this was amended by the Democrats in the General Assembly so that it provided for a License Commissioner, to be appointed by the Governor.

As department stores pay the same taxes which apply to other merchants in the State, they took steps to resist this legislation, and organized. In Kansas City criminal proceedings were instituted against some of the merchants. In St. Louis nothing was done by the License Commissioner beyond sending out notices. An injunction suit was filed in St. Louis, but the proceeding was not brought to a final hearing because of the advance on the docket by the Supreme Court of a case brought up from St. Joseph.

In St. Joseph, in order to make a test case, the City authorities refused to grant a merchant's license to a merchant, on the ground that he had failed to comply with the department store law. He thereupon brought a mandamus proceeding, claiming that the law was unconstitutional.

The mandamus was granted, and the case was appealed to the Supreme Court by the City, and this was the case decided by the Supreme Court.

MILLIONS OF MISSILES FAIL

Only One Shot in Ten Thousand Kills —Records of Famous Battles.

Answers. (English paper.)

With their daily bombardment of Ladysmith for 10 weeks, the Boers killed only 70 men. This is what all military authorities expected, for the shell makes more noise than it does damage. In past wars the most terrific bombardments resulted in only the same trifling loss.

Take the Franco-German war. The Town of Mezieres was bombarded with the greatest vigor for 38 days, over 5000 shells per day being thrown into it. This made a total of 193,000 shells falling among a closely packed population of 65,000 people. Yet only 300 people were killed, and 800 wounded. Now, each shell broke into from 100 to 200 pieces at least, so that it took 35,000 missiles to produce one hit!

Longwy was the most extraordinary instance of all the comparative harmlessness of shell fire. Quite 30,000 projectiles were thrown among the occupants. Certainly there were only 200 people altogether in the place. But of these not a solitary individual was killed or wounded.

During the whole of this terrible war, in which nearly 2,000,000 troops were engaged, and many millions of shells fired off, the Germans lost by shell fire only the trifling number of 696 officers and men killed, and 4389 of all ranks wounded. That is to say, the 1,000,000 German troops had one man in 200 hit by a fragment of a shell or a bullet from a shrapnel or case shot.

Yet the only weapon used in a siege is cannon—at least, it is far and away the most-used weapon. Of course, the shell wounds made up in quality for what they lacked in quantity, for a man wounded by a shell is not of much use thereafter.

Curiously, the modern cannon used in the war of 1870 were not much more destructive than the ancient weapons we used in the last century. During the great siege of Gibraltar, lasting from April, 1781, to February, 1782, the enormous number of 258,387 shells were thrown into the garrison. But the whole list of killed and wounded amounted to only 1241, and most of these—870—were only slightly hurt.

Shells did more damage in the Crimea. This was an exceptional case, however, for most of the losses were sutained in the great assault on the Redan. In other wars the rifle killed about nine to one for the shell, while in the Crimea four out of ten of the British and nearly five out of ten of the French were dispatched by shell fire.

We have many other figures proving that the shell is not so formidable as is generally supposed. When the Germans fought the Austrians, in 1866, they killed exactly nine by rifle fire to one by shell fire. The Austrians in were superior in artillery, as the Germans were in rifles, and they killed about one and one-half by shell to eight and one-half by rifle bullets.

In the United States Civil War only 14,000 were wounded by shell to 128,000 by rifle ball. This is a little less than one out of ten.

And in the Italian campaign of 1859 few were hit by bursting shells. Here are the figures: Wounded by bullets, 14,500; wounded by large shells, 160; wounded by shrapnel and case shot, 740. But this war was fought altogether in the open field, while the shell is most used against fortified positions.

Naval shell fire is not much more fatal. During the one-day bombardment of Alexandria by the British fleet, which lasted nine hours, 800 Egyptians only were hit by 3165 shells, and that in spite of the shells being of huge size.

Sampson Denies Concas's Statement.

BOSTON, Feb. 26.—Admiral Sampson today positively denied the statement made by Captain Concas, of the Spanish Navy, that the Cristobal Colon could have been saved if the American Admiral had closed her sea valves.

Colds ON THE Chest

are dangerous; they weaken the constitution, inflame the lungs, and often lead to Pneumonia. Cough syrups are useless. The system must be given strength and force to throw off the disease.

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will do this. It strengthens the lungs and builds up the entire system. It conquers the inflammation, cures the cough, and prevents serious trouble.

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Are acknowledge by thousands of persons who have used them for over forty years to cure a SICK HEADACHE, GIDDINESS, CONSTIPATION, Torpid Liver, Weak Stomach, Pimples, and purify the blood.

A form of disease may become so common that it is regarded as a necessary condition.

In some of the valleys of Switzerland goitre, or thick neck, afflicts every inhabitant. A party of American tourists entering one of these valleys was followed by a body of jeering children who cried, "See, these people have no goitres," as if to be without a goitre was a physical deficiency.

Similarly, the prevalence of irregular periods among young women, and the commonness of debilitating drains among married women have created the mischievous idea that these are the natural conditions of womanhood.

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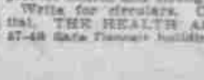

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