## THE EVENING TELEGRAM, ST. JOHN'S, NEWFOUNDLAND, JANUARY 27, 1923-6



Address Delivered by Dr. J. S. Tait Before St. John's Rotary Club on Tuesday, January 23rd.

Gentlemen .- In meeting with you advances which have been made to-day it will be utterly impossible for within the knowledge of my own me, in the short time at my disposal, reading and experience. The subject

less sea."

The subject of modern science is and essential truths, and she calls inclined to instinctively ory out: something relatively new in the upon every one of us to discover and "There comes to me out of the past wild: under the circumstances is simply to and material' welfare. The interest in Singing a song almost divine outline a few of the most important, the progress of scientific advance is And with a tear in every line."

rapidly spreading, and the demand for a more complete understanding of the laws whereby the world is governed, is easerly sought after to-day by the entire reading and thinking public. True science is the loving interpreter of the world we live in, and the minds of men capable of attaining to such the great and heroic souls, who have sac-of a revealation. To adopt Oliver inford the interest in the order of those trigs worde "by the end of 1888 the wave lengths in the forder according wave lengths. The shortest waves the low of the world we live in, and the minds of men capable of attaining to such the great and heroic souls, who have sac-of a revealation. To adopt Oliver eights of appreciation, and the evi- rificed their time and thoughts and Lodge's words "by the end of 1888 the wave lengths in millionthe of an dences around us of an all pervading labour, not to worldly purposes, but science of Electricity had definitely which are the only ones visible t ality, are only so many addi- to scientific pursuits; men whose annexed to itself the domain of op- senses. But visible light is only a ional reasons why we should obey names are carved high in the Temple tics, and had become an imperial very small part of all the vi he voice of nature, and strive to of Fame, to whose faithfulness and science." The wave theory of light of the ether, the medium in w comprehend, as far as we can, those courage and steadfast endurance, the having now become an established light is propagated. As the cap nique problems in connection with world owes so much to-day. If, in our fact, due to an electra magnetic dis- | for sensa that vast, sublime, age-enduring cos- retrospect to-day, we could only turbance in the all-prevailing ether, all knowledge, our physical mos, which we call the universe. gather into one noble edifice all their and being electric in character, there being limited can comprehend only

sacrifice and devotion to duty, the liv- appears to be no fundamental differ- very small part of the vibra MILESTONES OF LIFE. me, in the short time at my usposal, which I desire to bring before you to-to do more than give a mere outline of the work of modern science, so if day exactly coincides with the period of the work of modern science, so if the work of modern science in wireless tele-the science in the science in wireless tele-the science in the scien In the life of every individual there ing picture would be so great, and ence between light waves and the which are continually crossing or for myself, you will not expect my earnest desire that the effort glance over the road already trav- sciences and their application to very much longer, and the vibration of 8,000 miles in perfect darkness much in the short space of twenty herewith presented may be of some ersed. By this means the mind is en- modern life are playing a most im- very much slower, than in the former, the way, except for a distance of an abled not only to live over again the portant part in our daily existence, case. Light waves and wireless waves inch, for which short distance the "Nor can so short a time sufficient be, who value the new treasures of past, but to draw from the contem-plation thoughts both pleasurable and plate the close- are thus related in the same way that is brilliantly lighted would be a free see." Yet very few people realize the close- are thus related in the same way that is brilliantly lighted would be a free see." Yet very few people realize the close- are thus related in the same way that is brilliantly lighted would be a free see." Yet very few people realize the close- are thus related in the same way that is brilliantly lighted would be a free see." Yet very few people realize the close- are thus related in the same way that is brilliantly lighted would be a free see." Yet very few people realize the close- are thus related to one proportion of visible to invisible lighted would be a free see." Nature has set before our eyes great peinful and, with the poet, he will be personal welfare. An interest, how- of low ever, in the progress of scientific in- say a few words on electrical waves. sand miles of darkness, would giv

vestigation is becoming more marked, You all know that when a beam of very little idea of the world's history, and the best I can do utilize those truths for our own moral A voice whose tones are sweet and and a demand is springing up for in- white light, such as ordinary sun- traversed, yet visible to invisible light formation. upon recent advances in the light, is passed through a glass prism, is about in this proportion.

## THE VISIBLE SPECTRUM.

for political platforms, but it stands Name of Colour Wave length in millionths of an inch Frequency

Red	33	millionths	of	an	in.	-		-		284	ten	mill.	in
Orange	31	millionths	of	an	in.		-	-		264	ten	mill.	in
Yellow	28	millionths	of	an	in,	-				248	ten	mill.	in
Green	25	millionths	pf	an	iņ.					212	ten	mill.	in
Indigo	22	millionths	of	an	in,	-		-	•.•	196	ten	mill.	in
Blue	19	millionths	of	an	in.	**				164	ten	mill.	in
Violet	16	millionths	of	an	in.				2.	162	ten	mill.	in
Extreme Violet	16	to 4					1	15	1				
	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red

simply in mundane matters have died | You will see by this table that the produce the alpha, beta and game out, the names of all the true men of shortest waves are represented by rays. These new problems stand be science will live on in the minds and the Violet light, and the longest by fore us greater than ever before, and hearts of all those who love and ap- the Red. These waves which are if the promise does not fulfil the ex shorter than light, are the so-called pectation, then all advance in this di

ultra-violet waves, which lie just be- rection will come to an end. Anothe We all know the innate feebleness youd this, are about one thousanth line of discovery which has been of man before the immutable forces, smaller than those of the ultra-violet tremendous importance to the mode and the great mysteries, which every- light. On the other hand the waves theory lies in the field of Radiowhere surround us, But the human which are longer than light comprise tivity, which was opened up by t mind is so constructed that it recog- the so-called heat rays, which affect investigations of Henri Beegnerel nizes no bounds to the field wherein our temperature sense, and then the 1896. By this discovery matter a knowledge may be attained, so that Hertz waves, which are employed in energy are now no longer consider in the whole compass of educational wireless telegraphy. All these waves irreducible things. They belong I life, there are no pursuits more wor- travel at the same speed, at the rate longer to the immortals, they a thy than the search for new truths, of 186,000 miles per second. The simply the same things under diffe and the opening up of new paths in length of the shortest visible light ent aspects. Viewed in this light that immense unknown, so full of in- wave is about one-hundred-thou- there is no dictotomy between the terest, and harmony and beauty-the sandth of an inch, while the longest ponderous and the imponderable, and truth of which is emphasized by Hertzian (Marconi) waves measure emanations and ions, and electro from crest to crest anwhere from one and electricity are nothing more that "Great are the works of the Lord." yard to twenty-five miles. The rate at different phases of the dematerialize which these waves move up and tion of matter on its way back to it It was only in the beginning of the down depends upon the wave length; cosmic home to be finally and fi nineteenth century that the great dis- the shorter they are the more rapidly ever lost in the universal ether.

men who had caught the spirit which depends upon the amount of power the field of this instrument rev Newton, Franklin, Farady and Max- a big station is working, they rise to the highest class microscopes of or well, and to all those other Architects enormous heights. A wireless message day, being in its capacity for dete of the modern world. At the end of the can go from here to Australia in the mining minute particles of matter nineteenth century many thought that fifteenth part of a second. In one sec- thirty-seven trillion thirty-one bi all the great discoveries had been ond these waves could encircle the times more powerful than the been made, and that there was practically world seven and a half times. In one made modern microscopes. The X very little more to do, as there are and a half seconds they could travel Ray, discovered by Prof. Roenigen in

1895, has effected almost a revolution that such problems are beyond the CULTIVATION OF SCIENCE A NA- in our conception of atomic physic and the advance of knowledge wi One of the great duties of a nation in this short space of time has

of no unknowable. To do so would be is to promote the cultivation of truly marvelous. Then again the for her to mark off and exactly de- science, and practical research, and is the great subject of antiseptics an fine, the boundaries of the knowable, to stimulate discovery and invention antitoxins. As the present t No one has the right to make com- in every way possible. "With accurate there is scarcely a hospital in the munications respecting the future as experiment and observation to work civilized world where the principal matters of fact. It was once thought, upon," says Tyndall, "imagination be- of antiseptic surgery are not car and even by so recent, and so high an comes the architect of physical ried out. Not a household which authority as Comte, that the deter- theory." The recognition of the fact has not, in some measure, benefited mination of the chemical composition that scientific investigation carried on by it, not a medical man who is un of the heavenly bodies was an im- with the motive of acquiring new aware of its meaning. Listerian has saved more human lives than no meaning, his is the love of knowall the wars of the last century has ledge and the joy of discovery, and Spectroscope has been invented, and and in industrial research. The pur- sacrificed. At a banquet of the Royal now, just as the Biologist is enabled suit of truth is the essence of all Society the American Ambassador to trace up, step by step, the evolution scientific enquiry, and conveys as in proposing Lord Lister's health The individuals who have been reof all living things, so is the Astron- fully as the study of the masterpieces said: "My Lord, it is not a profession, it is not a nation, it is humanity advances, whether on the old or new itself which, with uncovered head, lines, are too numerous to mention salutes you.". Then I might mention Vacine therapy, which gives imnames on the monuments they have munity against microbic infection, joined in erecting, and science, no and the more we see of it, the more less mindful of her votaries, than reve are convinced that its discovery ligion of hers, will not fail to reward to mark a great era in medicine. The many theoretical and practical honour. The purport of this address mprovements made in the telescope, amply sets forth the spirit that ani- DR. A. B. LEHR, D e spectroscope, the electrosc ope, mates those great groups of scholars ave brought to us knowledge of the who year by year compose the varnost fascinating and instructive kind. jous associations for the advancement hen again there is the Automo bile, of science, whose opinions and dise Submarine, Annesthesia, the transmission of photography by wire, and a thousand other improvements and in the history of the world have there advances which, to the workers of tific man." The discovery of Radium been more learned assemblies, more twenty-five years ago, seemed alm ost wise councils-men specialized hopeless of solution, have been every department of science all take the best of care of structure of modern chemistry-Sin triumphantly achieved. striving to promote and extend knowledge-all appealing to the case. We will not hur William Ramsay speaks of as "the THE EINSTEIN THEORY. first observed case of transmutation Trinity of our Being-the Hand, the and we will get to thes and its emanation into Helium." This Lastly there is Einstein's substance is developed by spontaneous sidered the most important Heart, the Head. change in the emanation and goes to sult obtained in connection the theory of gravitation the time of Newton, and with silver, follows the popular mil-EE SPEAKING FROM EE is only fitting that I should r tion it here. It surpasses in bo everything previously suggested speculative philosophy, and even the philospohical theories of kn edge, and his reasoning in this matter out is considered of the highest achievements of thought. The only weak point i theory is the great difficulty i pressing it, especially by one completely conversant with phy ience. The great men who dominated the spirit of enquiry out like mile-stones along the an of the progress of science thro the ages, and to-day we are her TEEDMANS do them justice and to honour memory. To the true scientist ise and rewards of the world



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for nothing in science. The men who Extremest red .. .. 60 to 33 have advanced the human race throughout the ages are those who have stood for individuality, a against the platitudes of the crowd But long after the vulgar abuses and rabid sentiments of political writer and speakers shall have passed away and the labour of those who traffi preciate scientific worth. PIONEERS OF SCIENCE.

scientific field, "Vox Populi, Vox Dei,"

may be a sound democratic principle

Galileo inspired, and passed on to used for sending them out, and when

certain ultimate problems which from the earth to the moon. reach of human investigation is completely unscientific. Science can-speak

TIONAL DUTY.

coveries of the ages began to dawn they undulate. Waves one yard in DISCOVERY OF X-RAY. upon the consciousness of mankind length would rise and fall no fewer . Then there is the ultra-micro through the work of a few patient than 300,000,000 per second. Their size which by passing a beam of light th

