

## Editorial

### TESLA vs EDISON THE AC/DC CURRENT WARS MAKE A COMEBACK

*From Cosmos Magazine*

The decisive battle took place in 1893 at the Chicago World's Fair. On one side, the celebrated inventor Thomas Edison. On the other, his former employee Nikola Tesla.

And what were they fighting over – love, religion, territory? None of the above. They were fighting over alternating current (AC) versus direct current (DC).

A quick explainer: current in metal wires is the flow of electrons, pushed along by a voltage. If the voltage is sourced from a battery, the electrons flow in one *direction* only. We call this *direct* current, or DC. However, batteries are not a primary source of energy. For that, we often use coal or natural gas. Their chemical energy is released in a furnace as heat to create steam that turns the shaft of a generator. In the simplest case, the shaft spins a magnet inside a coil and through the principle of electromagnetic induction produces an electric current. The polarity switches from positive to negative and back many times per second as the generator shaft rotates, thus the current *alternates* in direction. We call this *alternating* current, or AC. Even though the direction of the current alternates, its effects do not cancel out. The current does useful things in both directions, such as heating the wires in a toaster.

Starting in the late 1880s, Edison developed a cost-effective means of generating DC electricity, and a suite of related devices, including motors and meters to measure DC energy consumed. However, there was a problem. There was no way back then to convert the DC voltage to higher or lower values. To be safe for use in homes and factories, the DC generators were designed to produce electricity at low voltages. The downside was that this meant the losses during transmission from the generator to the consumer were high. Edison judged that to be an acceptable compromise, but it limited the distance between the generator and consumers to less than a kilometer or two.

In the other camp, Tesla had a secret weapon known as the transformer. It is a simple arrangement of iron cores and copper windings that allows voltage to be converted up or down. The limitation is that transformers only work with AC electricity.

With transformers, Tesla could boost the generator output to thousands of volts for low-loss transmission over long distances then cut the voltage down again to safe values for final delivery to the consumer.

There was a lot at stake, including patent royalties and the right to electrify the cities of the United States. The raging battle was called the War of the Currents.

## WYNPRESS

The Rotary Club of

Wynberg



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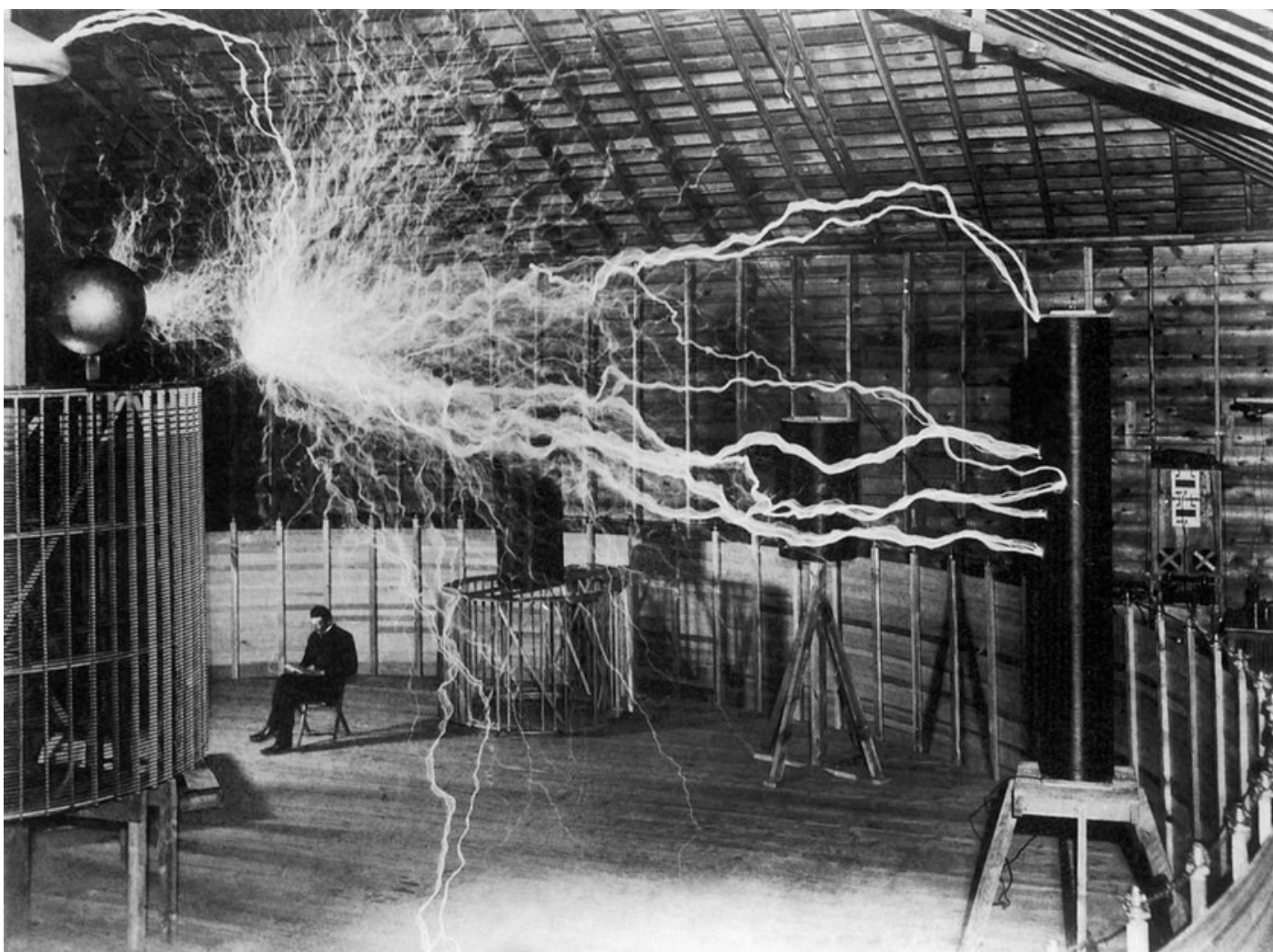
Barry Cleveland, Lina Howard,  
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**November Rotary Theme**  
**Rotary Foundation Month**

**Wynberg Rotary meet every**  
**Thursday, 6 for 6.30pm,**  
**Palm House, Wynberg.**

For more information about our  
club, like us on Facebook or visit  
our website:

**Wynbergrotary.org.za**



*Nicola Tesla in his laboratory 1899*

Feeling the tide of battle swinging against him, Edison changed tactics and launched a misinformation campaign to argue that AC current was dangerous. To prove his point he arranged the public electrocution of stray dogs, cats and horses.

These skirmishes continued during the lead up to the Chicago event, until victory was declared for the Tesla AC camp. They were awarded the contract to electrify the Fair. From there it was all AC, with the definitive stake in the ground being the 1896 electrification of street lights in the city of Buffalo with AC power supplied from hydroelectric generators at Niagara Falls.

AC distribution of electricity has reigned supreme for more than 100 years. But a quiet insurrection is taking place in our midst. Our computers, machines, LEDs and electric cars all run on DC. And at the extremes of high power – distributing electricity thousands of kilometers from one region to the other – engineers have discovered that the losses from a million-volt transmission line are lower if it carries DC current rather than AC current.

Once again, the transformer is the secret weapon, but this time operating on DC. These new transformers take the form of electronic circuits that convert DC currents up and down the spectrum from a few volts to a million or more. Lighter and smaller than traditional ones, DC transformers make it easier to integrate wind and solar electricity into the grid, and they reduce the likelihood of failures cascading from one electricity generation region to another.

In the coming decades, we may see the DC insurrection take hold. Not through warfare this time and no public electrocutions of stray cats. Instead, it will be a subtle, gradual process. But by the turn of the next century Edison may well have the final victory.

*Submitted by Barry Cleveland.*

# Minutes

9 November 2017

Compiled by Hugh Maunder

## Attendance

16 members present

## Visitors

PDG Sylvia Whitlock (Guest Speaker), Mary-Anne Calvert, Bronwyn Maree

## From the President's Chair

Pres. Rob detailed the diary for the future weeks with specific emphasis on 'Uncle Paul's Charity Night' on 12<sup>th</sup> December and the club's 'Christmas Dinner' on 14<sup>th</sup> December.

**David:** Karmøy Rotary Club in Norway would be able to only accommodate up to 16 members on the midyear 2018 visit, scheduled for a week beginning 16 July.

**Biffy:** The upcoming attendance at the District Conference in Lüderitz together with a tour of the area will take 11 to 12 days and cost about R10 000.

**Stephen:** 1. Karmøy Rotary Club are selling used books and intend to give the money they earn to our Library Corners programme.

2. Seahouses Rotary Club sent R4500 to purchase text books for Lavender Hill School.

## Slots

## Guest Speaker



PDG Sylvia, told us she was the first female member of the Rotary Club of Duarte, California. Just before its twenty-fifth birthday in 1976, the Duarte club violated Rotary's bylaws by inviting women to join, ultimately causing its charter to be unceremoniously revoked by Rotary International. Undeterred, the club renamed itself the Ex-Rotary Club of Duarte. Its members undertook a long legal quest which, in 1989, resulted in the Council on legislation voting to eliminate the requirement that club membership be limited to males, permitting clubs worldwide to admit women. Sylvia considers Rotary to be the best vehicle she knows for humanitarian ventures in service to mankind.

Biffy introduced and thanked Sylvia.

## President's Sweetie Pie

President Rob awarded Sweetie Pies this week to the editorial team.

## Swindle

Bronwyn, a visitor, could have won R1000 but drew the wrong card (aah shame!) Stephen took home the grand sum of R25 for attending.

## Dates To Diarise

<b>16 November</b>	Biffy's report back on her recent trip to USA
<b>23 November</b>	Social: Visit to Clay Café, Hout Bay. Book with Keela
<b>30 November</b>	Social at Jack Black Brewery. Book with Justin
<b>7 December</b>	WRC hosting at Uncle Paul's Christmas Party
<b>14 December</b>	Christmas Party (also the last meeting of the year)
<b>14 - 17 Dec.</b>	Carols at Kirstenbosch, from 18.30 to approx. 21.30 each evening

Duty Roster	November			December
	16	23 SOCIAL	30 SOCIAL	7
Sergeant	Schreiber	Clay Café	Jack Black Brewery	WRC Hosting at Uncle Paul's
Wynpress Editorial	Van Niekerk			
Wynpress Minutes	Van Niekerk			
Door Duty	Jackson			
Grace	Smith			
Loyal Toast	Howard			
International Toast	Overbosch			
Speaker Intro and Thanks	Howard			
Entertainment for the month	Overbosch, Schreiber M, Smith, Todd, van Niekerk K			

## Tailpiece

English doesn't always translate well from some foreign languages. Here are a few signs for English speaking visitors to countries abroad:

Cocktail Lounge, Norway: **LADIES ARE REQUESTED NOT TO HAVE CHILDREN IN THE BAR.**

Doctor's Office, Rome: **SPECIALIST IN WOMEN AND OTHER DISEASES.**

Dry Cleaners, Bangkok: **DROP YOUR TROUSERS HERE FOR THE BEST RESULTS.**

Athens hotel: **VISITORS ARE EXPECTED TO COMPLAIN AT THE OFFICE BETWEEN THE HOURS OF 9 AND 11.**

Leaving Nairobi: **TAKE NOTICE: WHEN THIS SIGN IS UNDER WATER, THIS ROAD IS IMPASSABLE.**

On a poster at Kencom: **ARE YOU AN ADULT THAT CANNOT READ? IF SO, WE CAN HELP.**

In a City restaurant: **OPEN SEVEN DAYS A WEEK AND WEEKENDS.**

On the menu of a Swiss Restaurant: **OUR WINES LEAVE YOU NOTHING TO HOPE FOR.**

German Camping site: **IT IS STRICTLY FORBIDDEN ON OUR BLACK FOREST CAMPING SITE, THAT PEOPLE OF DIFFERENT SEX, FOR INSTANCE MEN AND WOMEN, LIVE TOGETHER IN ONE TENT, UNLESS THEY ARE MARRIED WITH EACH OTHER FOR THIS PURPOSE.**

Moscow Hotel: **YOU ARE WELCOME TO VISIT THE CEMETERY WHERE FAMOUS RUSSIAN AND SOVIET COMPOSERS ARTISTS AND WRITERS ARE BURIED DAILY EXCEPT THURSDAY.**

Airline ticket office, Copenhagen: **WE TAKE YOUR BAGS AND SEND THEM IN ALL DIRECTIONS.**

Austrian ski lodge: **NOT TO PERAMBULATE THE CORRIDORS IN THE HOURS OF REPOSE IN THE BOOTS OF ASCENSION.**

Elevator in Leipzig: **DO NOT ENTER THE LIFT BACKWARDS, AND ONLY WHEN LIT UP.**

Tokyo car rental: **WHEN PASSENGER OF FOOT HEAVE IN SIGHT, TOOTLE THE HORN. TRUMPET MELODIOUSLY AT FIRST BUT IF STILL OBSTACLES YOUR PASSAGE THEN TOOTLE WITH VIGOUR.**

Tokyo hotel: **IS FORBIDDEN TO STEAL HOTEL TOWELS PLEASE. IF YOU ARE NOT A PERSON TO DO SUCH THING IS PLEASE NOT TO READ NOTICE.**