

Feature Article

Time and ANTICLOCKS

Burkhard Fricke[†]

If you ask yourself what 'time' is, you know it. But if you have to explain it to someone else, you do not know. This is a statement of a philosopher which is already 2000 years old. The simplest modern definition comes from Albert Einstein who said, that time is what a clock shows. This is very pragmatic statement, but one does not know better. The concept of time is trivial: Any periodic system can be used and is used for time measurement. But why is a clock? The answer is easy. Each system which has a (hopefully) constant periodicity is a clock e.g. a pendulum or a balance. There is another curious fact. If you read the time on the clock, you do a length or position measurement. This means that we do not have an original direct time measurement, it is always done via a position. Our normal clocks you observe the position of the long and short hands. But why do the hands in the clock run clockwise? This has historical reasons. Probably the first instruments which measured the time was a Sun Dial. Sun rises in the East, culminates in the south and sets in the west. Shadow moves the other way round which now a days is clockwise in our culture. If the first mechanical clocks would have been invented in the southern hemisphere of our Earth our clocks would run the other way around which we call anticlockwise.

There are people who argue that the Earth

rotates anticlockwise, so the clock should do the same. Indeed there exist clocks who run anticlockwise. This is rare and a curiosity. In addition one could argue and ask why do the hands on the clocks run twice a day from 1 to 12 where as the Earth rotates once in 24 hrs. The division of the day in two parts of 12 hours each is so historic that nobody knows the reason. This 12 hour per half day was used in many cultures and times.

Following this argument there exists 24 hour clocks. Even in the middle ages many clocks in churches for example were of 24 hour type. These are very useful in areas of the world where it is not possible to decide if it is e.g. 4 o'clock in the morning or 4 o'clock in the evening, like in northern Scandinavia or Canada. But professions like sleeping car companions or engineers who work inside buildings or miners who work underground it is very helpful.

The only change once was made in the French revolution in the 1790s. There the time was measured in twice 10 hours and each hour was 100 minutes. So the day had 2000 minutes which you can compare with our 1440 minutes nowadays. So this minute was somewhat shorter.

But this concept was given up already in the early 1800s after about 10 years. In order to be absolutely consistent with all the physical and

[†]Emeritus Professor of Physics, University of Kassel, Germany, fricke@physik.uni-kassel.de

astronomical arguments, as mentioned here, one should have clocks who move anticlockwise and have a 24 hour display. Pictures of 24 hr clock and anticlock and a 12 hr anticlock are as shown from my collection of 23 anticlocks which were bought on auctions and was built by someone else.



A clock which runs the wrong way and has 24 hours



A clock which runs normal but has 24 hours



A clock which runs the "wrong" way and has 12 hours