SWCP Portal
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Hundreds of channels but is there anything good on?

The Triumph of Television

Television, the most popular medium in history, has been through an amazing **technical evolution** throughout its **history** and it's still changing. Like the internet, **people** around the world have contributed to its development, making TV truly universal.

It began in the 1850s with the **fax machine** which allowed the transmission of still images, conveniently invented around the time of the first telegraph companies. Through the rest of the century, inventors often experimented with **whirling discs** perforated with small holes to scan scenes for light detectors.

From whirling discs to cassette players

By 1910, the first device to send images of simple geometric shapes instantly between cities was made. It used a small grid of photoelectric cells but was too costly. Phosphor-coated **cathode-ray tubes** (CRTs) were developed to first display the images, and only later adapted to transmit them. The wonderfully-named American inventor, **Philo T. Farnsworth**, achieved this with his "**image dissector**" in 1927.

Philo's gizmo was the first real TV camera, which he sold to RCA. International competition throughout the 30s rapidly improved systems so that the **1936 Berlin Olympics** were broadcast live, as the movie ***Contact*** shows, when aliens responded to **Hitler's opening speech** causing alarm among the scientists.

After the war, TV *really* took off. By the time most Americans were introduced to TV in the 1950s, there were 4 networks. **CBS** and **NBC** were the first, based on radio networks, soon joined by the pioneering **Dumont** network, owned by an electronics manufacturing company, and by **ABC**, another radio family.

TV sets were large, bulky, almost desk-sized, yet the screens were tiny, rounded and bulging at the sides, with gray, fuzzy images with bright highlights often surrounded by black rings. There was an on/off sound control knob, one to change channels, and smaller ones to keep the picture still and bright.

The sets took a few minutes to warm up, but for a baby-boomer child, seeing the image slowly swim into view was truly wonderful, like opening a magic mirror. TV was our crystal ball, and the demand for visual content to fill it came instantly and constantly.

Technical changes came like clockwork. **Color** was being worked on before the first cameras were perfected. **Picture tubes** grew greatly in size and quality, and became more rectangular. **Remote controls** were added – first just switches made by fed-up users to kill the sound during ads, but soon fully-powered wireless controls were included by manufacturers.

These all helped contribute to TV's big struggles – viewers against advertisers, TV versus the movie industry, and for broadcast standards: all three of which are still concerns today. Along with the way new expensive technologies gradually become less pricey and more widespread, how these trends have played out has greatly shaped our viewing habits.

For instance, home **video cassette recorders**, (VCRs) first marketed in 1956, did not become wildly popular until the 80s, delayed by fears they would disrupt Hollywood, destroy advertising, and void copyrights. They didn't: instead VCRs led to **video tape rental stores**, a second life for movies after their theatrical runs, **direct-to-TV** and niche programs, more clever ads, time-shifting, fan communities revolving around shared experiences of an hour or two, and yes, even the entire home pornographic movie industry.

From cable to the internet

All these things are still with us in one form or another – aside from the stores as the **VCR is dead** – the last manufacturer stopped making them in 2016. Instead, tapes have been replaced by digital recordings and shows that can be watched on demand.

Cable broadcasting also brought conflicts. It originated in 1948 to serve remote, isolated communities. By the 60s, systems were owned by big corporations and rebroadcast distant signals which alarmed local stations. As a result, the **FCC** restricted cable's ability to offer live sports, syndicated shows, and movies for years. But In 1972, cable was deregulated, and along with satellites and the advent of the first pay-TV channel, **HBO**, cable TV was off and running.

Viewers' experiences changed yet again. Many now had another bill to pay each month, often bigger than their phone bill. Limited competition in many markets brought virtual monopolies. But cable networks could host a lot of channels, and along with pay-per-view and various premium channels greatly increased the quality and abundance of fine shows.

Continued on back

Continued from front

All this is with us today. Yet cable is more expensive than ever, with a dizzying number of packages that seem to make it impossible for the viewer to get exactly what she or he wants and nothing else. Customer service leaves much to be desired, too.

The result has been a great deal of simmering customer dissatisfaction, with cable giant Comcast being even **more hated** than the IRS for the last several years. This helped fuel the movement to switch to streaming over the internet. However, since Comcast and other giant providers are also some of the biggest ISPs, that dissatisfaction carries over.

Unfortunately, all this affects web users who neither stream nor use cable, because of **net neutrality**, which is a fundamental principle of the internet. It holds that all internet traffic should be treated the same regardless of source, content, or destination.

This key provision came under attack by big cable and ISPs who resented that other providers could send their huge streams freely over *their* networks. The reason is simple: **the internet is *not* a broadcast medium** and must be forced to behave like one.

The net is wholly based on data in discrete packets flowing in both directions at once. Each show is sliced up into tiny data bundles; every one sent forth to find its own way across the networks to be rebuilt into moving pictures in the receiving computer.

Sender and receiver must work together. The video is thrown on the screen after just a small portion has been received – the moving image barely keeps ahead of incoming traffic. But the receiver must confirm reception, and get any replacements for missed or damaged packets before reassembling them in the right sequence. And it all must be done on the fly.

Supplying video streams is complicated and requires high speeds and a vast amount of traffic which gobbles up bandwidth. Hence the jealousy of the big providers. Unless they are **stopped by law**, well-off viewers may expect to pay even more to watch their favorite programs while poor ones might get even less access and slower speeds generally in return.

Digital and beyond

One of the ironies of early adoption is that it often leaves the adopters behind. Philo's device broke down the picture into horizontal scans: the US system was based on 525 lines, while the later one chosen in Europe had 625 – allowing higher resolution.

Returning to **pixel-based cameras** and the invention of **flat-screen TVs** required the change from over-the-air **analog** broadcasting to **digital**, which **happened in America** on June 12, 2012. Everything (except for a few local stations) is digital now.

Whether wall- or pocket-sized, TV screens can now be just a fraction of an inch thick, and there are more over-the-air broadcast channels than ever before.

As with audiophiles, TV today has a zoo of esoteric buzzwords with arcane debates over which particular display method is best. But it really doesn't matter: technology is fast approaching the limits of human perception, and improvements nowadays are incremental at best. The highest resolution now, **4K Ultra HD**, has 3840 × 2160 pixels – over *4 times* the number of scan lines in an old cathode-ray TV screen.

Another current buzzword is **High Dynamic Range** (HDR) which enhances color, giving brighter whites, darker blacks, and a wider gamut in between. However, HDR is tied to the screen display technology and thus comes in confusing variations. Both 4K Ultra HD and HDR, however, may require **special cables**.

There are still fads, of course, but the craze for **3D shows** never took off, and **curved screens** are also no longer a hot item. Maybe **flexible video screens**, promised for years, will be the next big thing.

Streaming is definitely the wave of the future, but unhappily, like cable, comes in many packages but few simple a la carte solutions. Like cable, also, you'll need a TV equipped for streaming, such as an **Apple TV** or **Android TV**, or an internet-connector device, such as a **Roku**. But as these all come with various access plans, they can make it easy for newcomers.

All have access to the biggest and oldest streaming service, **Netflix**, started as postal-based competition to video rental giant, **Blockbuster**, since gone the way of the VCR. All also have access to streaming versions of **HBO**. **Satellite TV** provider **DirecTV** now offers a streaming service with a range of plans just like its more traditional space-based services.

Hulu, which started out as a free online repository of old network programs, and **YouTube** also offer premium networks. But probably the most adaptable in terms of tailoring selections, with a wide range of plans and plenty of add-ons would be **Sling TV.**

There's **Acorn,** which is all British. **CBS All Access** offers CBS's catalog and content including ***Star Trek Discovery,*** and of course, there's **Amazon Prime Video**, the new home of ***The Expanse***. (Yay!)

Good thing there are great choices; Americans **still love** their TV. We watch nearly 8 hours of traditional TV *per day*. And that's not counting streaming!

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