Cone Beam magazine seeks to provide its readership with pertinent information of all things cone beam, including its historical origins by those who pioneered the development in dentistry from an imaging standpoint. Bruce Lipsig, who is the director of imaging for Henry Schein Dental, is one of the innovators who brought 2-D and 3-D imaging to dentistry.

To give our readers a perspective and evolutionary look at where we've been and where we are in dental imaging, would you take us through your involvement and the innovations you’ve been involved with?

For me it began in 1991. While working in the music industry I learned how sound changes were not only related to what effects were used on those sounds, but also in what order those effects were applied. For example, if distortion was added to the guitar first and then echo was added you would be echoing a bunch of distortion, whereas if you placed the echo first in the chain then you could distort your echo — so these are two completely different outcomes. This started my interest in “perfect pairings” as we would combine different elements to create a superior outcome.

From that point, a friend who had been watching requested that I come to his company and perform similar fine tuning of their video. They were perfecting one of the first intraoral cameras called the AcuCam, and from the moment I got involved, I was hooked.

Building the early AcuCam for New Image Industries, I made two lifelong friends with whom I helped design and developed products. Together we created the first dental imaging products called AcuCam PC — running on DOS and early Windows 3.11 — as well as the cosmetic imaging application called AcuView, which provided the ability to morph patient images to show potential before and after images of planned procedures, such as bleaching and bonding.

These products changed the profession in many ways, bringing about a period of co-diagnosis whereby the patient was actually able to see not only what the clinician was viewing, but also what the clinician was planning as a final outcome.

We also investigated early digital radiography through a company in Sweden called Regan, as well as many others. This technology was still in its earliest stages of testing, something called “direct detection” whereby the energy from the X-ray head was captured on a sensor/chip. Unfortunately, at that time, we were just learning that with direct detection the energy from the X-ray head was too powerful and would damage the chip as well as the components on the back of the chip very quickly.

Thus, indirect detection, whereby a scintillator would convert the energy from the X-ray photons to visible light that the sensor/chip could then image, would be needed if digital X-ray were to succeed. It was from those early days that the groundwork was laid for the future of digital radiography.

Some readers may remember those products from the early days of technology. Where did it go from there?

My team and I left New Image in 1995 and founded a company called Integra Medical where we created the award-winning Vipersoft suite of imaging software and ViperCam intraoral camera. This suite of imaging software also included a morphing software application for cosmetic imaging.

This application actually allowed the clinician to show a patient not only what they were seeing, but what they were thinking in terms of potential treatment options by allowing the clinician to modify/morph the image to show the potential outcome of certain proposed treatments, such as bleaching and bonding.

Henry Schein acquired Integra Medical in 2000 and paired our Vipersoft imaging software with the industry leading Dentrix practice management software, rebranding our Vipersoft imaging software as Dentrix Image and creating the first digital dental office [DDO]. Finally, the dental office was computerized in the front office and the operatory with all
systems linked together. Along with the relationship to these desktops came the opportunity to provide peripherals that the clinician needs, such as digital radiography.

Digital radiography had quickly become the buzz words of the industry. It was the thought of having X-rays appear on your computer screen instantly for diagnosis, archiving and transmission, and the thought of these reusable X-ray chips not only replacing standard film and developing chemicals, but also accomplishing this task with as much as 90 percent less radiation than film.

Safer for the patient, safer for the staff, better for the environment and already digital for transmission to insurance companies, this product had so many advantages it was guaranteed to change the industry.

As we can see today, more than 60 percent of offices now use digital radiography, and that is only one way that the move to digital has changed the dental industry, and many other industries, forever.

From that point, we set out developing digital radiography, the intraoral camera and dental imaging technology for Henry Schein. When we started this journey, there were no computers in the operatories, and even very few computers at the front desk. Today computers are essential. The dental office relies on computers and would be hard pressed to survive without them. Two-dimensional imaging had found a home in dentistry, but this was just the start.

With the introduction of the CT scanner in the medical world, it was quickly understood that 3-D imaging would be the next wave of technology. In addition, that it could have incredible opportunities in the dental industry, from understanding bone density for placing implants to viewing bone and airway abnormalities, orthodontics, sleep apnea and a world of other opportunities found in the dental industry.
‘Three-dimensional imaging is the future of dentistry in many ways, and the sooner it is embraced, the sooner we will reap the benefits.’

This has sparked a new theory that has truly excited the dental community. Finally, we have a practical solution, restorative driven implant therapy, which refers to planning implant therapy from the restorative point of view. Simply put, this means placing an implant while being sure to take into account the requirements for the placement of the restoration.

This theory offers the general practitioner more control over the treatment from planning through completion and assures a more confident restorative result for the patient.

Speaking of perfect pairing, you’re also known as a wine connoisseur/collector. Please tell us about this passion and how it relates to what you see happening in dentistry with cone beam.

I developed a passion for wine collecting in 2000 and found that wine is another opportunity to pair two things together and achieve a higher level of value/satisfaction than either part was capable of alone. There are some wines that are bursting with flavor, yet pair them with a particular food and along with the bursting flavor you can suddenly decipher nuances that you never noticed before.

Flavors that seemed hidden before but are brought to a new level due to the pairing. This started me on a quest to test different pairings and find out for myself how incredible some of these flavors could be.

There is no one universal wine, although good arguments could be made, but rather there are different wines for different occasions; different wines match more properly with different flavors. It is a never-ending learning, testing and tasting opportunity. There are some rules, but they are more like guidelines.

I continue to find things that together raise an evening to a new level. Such as a fine Bordeaux paired with the strong flavors of lamb, or the way a fabulous sauterne such as a Chateau d’Yquem can pair perfectly with chocolate and dessert, as well as blue cheese and Foie gras. The possibilities are endless.

This also relates for me to the aspect that not all technologies can be or should be paired. There are optimal pairing partners. Manufactures of cone beam and CAD/CAM have worked to optimize their systems with either a particular proprietary system [CEREC and Galileos] or more of an open selection [E4D and i-CAT, Gendex, OP-300 and Scanora] providing clinicians a wide variety to choose from.

In the wine world we call this a broad pairing opportunity, where a wine pairs perfectly with several varieties, thus giving you more options.

Two elements elevating each other to heights that neither one could achieve alone. This is also shown in the growth of technology itself. Technology is rapidly changing and creating paradigm shifts in our...
industry, assisting users in doing things that they could not do before.

What have been the major developments over the years in imaging technology and how do you see it progressing?

The power found in today’s computers is one of the major developments that allow us to do more. It takes minimal computer power to handle practice management, which are mostly text driven files that are not very large and do not take much power to render to the screen. Imaging is quite different. Two-dimensional images can take much more computing power. X-rays are actually single images displayed in grayscale, although they can be high resolution, which makes them a bit larger and harder to deal with.

Yet, full-color images from intraoral cameras and digital cameras take a bit more processing power; especially if you realize that the live previews found in intraoral cameras are actually rendering many full color images/frames per second on the screen. The current CAD/CAM and CBCT files are so large that it would have been nearly impossible to move/render the image files that we use today.

While the power of the computer has made most of this technology usable, other technological advances make some of these systems function better than others. New laser scanning in some CAD/CAM systems allows you to avoid the need to prepare the subject with powder, which is often used as a contrast agent to avoid reflection when scanning images. And some of the new CBCT systems offer adjustable fields of view to avoid higher radiation doses that are unnecessary for certain focused procedures.

It was the combination of such new advancements that led us to some of the best pairings in technology whereby the industry leaders in CBCT and CAD/CAM paired together the best of the best technologies to create the best solutions in the marketplace today. E4D Compass [D4D Technologies, Richardson, Texas] is a great example of this. This is technology that assists clinicians to do more.

Any additional thoughts on the future?

The future will be incredible. Computing power that originally needed a room the size of a gymnasium is now available in your watch. They say that if the automobile industry had progressed as much and as quickly as the computer industry that we would all be driving in cars that could travel at the speed of sound and cost a nickel.

I still remember the first time I had a picture in my mind of what videoconferencing might look like. I pictured a standard touch-tone phone hanging from the wall with the chord hanging down and a small viewing screen attached to it on the side; much more like an intercom system from a gate where you could see someone on the other end.

I never would have anticipated how quickly we would have face time conversations on full color screens the size of a few credit cards, such as the iPhone.

The rate of progress has been amazing. Technology such as cone beam gives us more data than ever before and the uses of this data are just beginning to come to light. Three-dimensional imaging is the future of dentistry in many ways, and the sooner it is embraced, the sooner we will reap the benefits. I personally can’t wait to show you what is coming next!