INCISOR

WELCOME TO INCISOR!

This is the first edition of a new, electronic publication which covers the emergent Bluetooth sector.

Bluetooth is a technology that crosses the telecommunications and computing industries. Leading companies such as Ericsson estimate that before the year 2002 Bluetooth will be a built-in feature in more than 100 million mobile phones and many millions of other communications devices ranging from headsets to mobile and desktop computers. Bluetooth will be all around us.

Global technology leaders Ericsson, Nokia, IBM, Intel and Toshiba founded Bluetooth. These five companies are now supported by more than 240 other organisations as wide-ranging as TDK Systems, Dell Corporation, Fujitsu, Hasselblad and Texas Instruments.

Such an important new technology will be of outstanding interest to organisations across the world. Using the global email medium, we will be sending you this newsletter each month. Incisor will explain Bluetooth, will distribute the views of the players in the market, and explore Bluetooth applications.

Let us know your views. Like Bluetooth, Incisor will evolve rapidly and grow to suit market needs!

WHAT IS BLUETOOTH?

Back in May 1998 an initiative called Bluetooth - sponsored by Ericsson, IBM, Intel, Nokia, and Toshiba - was launched with the expressed intention of creating a new industry standard. In essence Bluetooth provides for radio based wireless connections between mobile computers and mobile phones. To date Bluetooth has garnered support from over 240 diverse organisations all with a major interest in promoting mobile computing.

A truly global standard

Bluetooth will operate in the unlicensed ISM (Industrial Scientific and Medical) 2.4 GHz region. Basically that's the same kind of radio technology which has given the world wireless door chimes, automatic garage door openers and microwave ovens. The good news is that ISM frequencies are recognised internationally. So - unlike mobile phones - the same device could be used in Japan or North America as well as in Britain and the rest of Europe.

Voice and Data

The technology will work much like cordless home telephone handsets where there are transceivers (portable devices) and base stations. In effect you'll be able to operate up to 8 devices in a peak cell and each offer both data and voice connection. The only drawback is that an individual Bluetooth device will actually enjoy an asymmetric data connection - totally 721 Kbit/s, with the up channel running at 56 Kbit/s. The most unusual aspect to Bluetooth is that immediately two compliant devices recognise each other, they will try to synchronise their databases. So a device such as a PDA like 3Com existing PalmPilot would start to 'HotSync' as soon as it got in range of your PC, for example.

Not re-inventing The Wheel

The Bluetooth standard hasn't evolved in a vacuum, either. In truth, Bluetooth draws heavily on existing wireless LAN technology, borrowing heavily from the IEEE's 802.11 (the existing standard for wireless Ethernet). The chief differences are that in order to consume less power, Bluetooth is restricted to just 10 metres (40 feet) and presently runs at approximately 1 Mbit/s, but eventually Bluetooth should be able to offer a range of up to 100 meters. Bluetooth's chief advantage over infra-red is that it does not require line of sight - so you can have your Bluetooth enabled mobile in your jacket pocket happily communicating with a Bluetooth enabled PDA or laptop in your briefcase.

IPR Free

Perhaps one of the most significant aspects to Bluetooth is the fact that all participants in the consortium have surrendered their intellectual property rights (IPR) in order to participate in the Bluetooth process. This is one of the key reasons why time to market for Bluetooth compatible products will be so short. All the major mobile handset vendors were, in effect, working to the same agenda. A wireless interface is the logical successor to the infra-red interfaces which existing handsets already support. So much of the groundwork had already been done. By throwing the fruits of their independent R&D, Bluetooth companies not only save time but will benefit from a single, global market and consequently much lower component costs.

ABOUT THE BLUETOOTH FOUNDING COMPANIES

Ericsson is the leading provider in the new telecoms world, with communications solutions that combine telecom and datacom technologies with the freedom of mobility for the user. With more than 100,000 employees in 140 countries, Ericsson simplifies communications for its customers - network operators, service providers, enterprises and consumers - the world over. Please visit Ericsson's Press Room at: http://www.ericsson.se/pressroom.

IBM, the world's largest computer manufacturer, is also the world's largest software company and the world's largest provider of information technology services. Additional information is available at www.ibm.com.

Intel, the world's largest chip maker, is also a leading manufacturer of computer, networking and communications products. Additional information about Intel is available at www.intel.com/pressroom.

Nokia is a broad-scope communications company supplying mobile phones, mobile and fixed telecommunications networks, wireless data communications solutions, multimedia terminals and computer monitors. In 1997, net sales totaled FIM 52.6 billion ($9.8 billion). Headquartered in Finland, Nokia is listed on the NYSE (NOK.A), has sales in 130 countries and employs more than 41,000 people worldwide. Additional information about Nokia is available at www.nokia.com

Toshiba, with sales of $44 billion (sales for fiscal year ending March 31st, 1997), is the world's sixth largest electronics and electrical equipment manufacturer. Toshiba Corporation is a world leader in high-technology products with over 180,000 employees in more than 55 countries throughout the world. Founded in 1875, Toshiba has had a long history as a technological innovator and invested more than $2.6 billion in R&D in 1997.

SO WHERE DOES BLUETOOTH FIT IN LIFE?

The following are potential applications for Bluetooth technology that have been identified by the original SIG group partners. Truth is this is just the start. Once Bluetooth technology is available, expect new applications and uses to appear daily.

The three-in-one phone
Use the same phone wherever you are.

When you're at the office, your phone functions as an intercom (no telephony charge). At home, it functions as a portable phone (fixed line charge). And when you're on the move, the phone functions as a mobile phone (cellular charge).

The Internet bridge
Surf the Internet regardless of the connection.

Use your laptop to surf the Internet wherever your are, and regardless if you're cordlessly connected through a mobile phone (cellular) or through a wire-bound connection (PSTN, ISDN, LAN, xDSL).

The interactive conference
Connect all participants for instant data exchange.

In meetings and conferences, you can share information instantly with all participants, and without any cord connections. You can also cordlessly run and control, for instance, a projector.

The ultimate headset
A cordlessly connected headset keeps your hands free at all times.

Connect your headset to your mobile or any wire-bound connection to keep your hands free for more important tasks when you're at the office or in your car.

The laptop speaker phone
Use your laptop as a speaker phone wherever you are.

Connect cordless headsets to your laptop and use the laptop as a speaker phone regardless of whether you're in your office, in your car or at home.

The briefcase trick
Use e-mail while your laptop is still in the briefcase.

When your laptop receives an e-mail, you'll get an alert on your mobile phone. You can also browse all incoming e-mails and read those you select in the mobile phone's window.

The forbidden message
Write e-mails on your laptop while you're on an aeroplane.

As soon as you've landed and switched on your mobile phone, all messages are immediately sent.

The automatic synchroniser
Automatic background synchronisation keeps you up-to-date.

Automatic synchronisation of you desktop, laptop, notebook (PC-PDA and PC-HPC) and your mobile phone. So, as soon as you enter your office the address list and calendar in your notebook will automatically be updated to agree with the one in your desktop, or vice versa.

The instant postcard
Send instant photos and video clips from any location.

Cordlessly connect your camera to your mobile phone or any wire-bound connection. Add comments with your mobile phone, a notebook or your laptop and send them instantly to a receiver anywhere in the world. Suitable for professional as well as personal use.

The cordless desktop
Connect all peripheral tools to your PC or to the LAN.

Cordless connection of your desktop or laptop to printers, scanners and to the LAN. Increase your sense of freedom in everyday work by cordless connection of your mouse and keyboard to your PC.

BLUETOOTH AT ATLANTA 27th-29th October

Totally Unattached - No Cords, No Wires, No Plugs, - No Kidding. So ran the slogan on the T-shirts presented to the delegates at Atlanta for the first Bluetooth SIG members' meeting. This marked a major milestone in what must be one of the fastest standards developments that this industry has ever seen. Bluetooth was officially launched in March of this year, with the backing of a quinumvirate of industry leaders - Ericsson, Nokia, Toshiba, IBM and Intel. At that point, there was a broad description of what Bluetooth would offer - a future of connectivity without cables. Eight months later we have a preliminary version of the specification, running to over 400 pages, and 240 member companies eager to promote the technology.

In Atlanta, Georgia, over 360 delegates from around the world gathered for the first major meeting to discuss Bluetooth and plan the way ahead. It was an intense three days of technology and marketing presentations, where the founder members explained their vision, and adopters discussed applications and ways to enter the market.

Bluetooth is, first and foremost, a cable replacement. In its simplest form, which will probably emerge as the first commercial application, it provides a wireless link between a handset and a computer or headset. That immediately points out one of the key advantages of Bluetooth - it permits both data and voice communication. Unlike existing GSM data solutions, using a serial cable or PC Card, which confine themselves to data, Bluetooth is flexible. At the core of the standard is a transfer pipe which can be configured to provide up to three voice channels or data, or any combination. The raw data rates can go up to 721kBps, so it's fast enough to consider many applications.

Although Bluetooth has been heavily promoted by the mobile phone manufacturers, it doesn't just have to apply to mobile phones. Amongst the earliest products being envisioned is the PC - PDA link for synchronisation. Most users synchronise their PDA's rarely, and their laptops even less often. It's awkward to keep on fishing for a serial cable, and you may not even get time to take your laptop out when visiting the office. Bluetooth provides the means to synchronise whenever you come within range of the base PC. The implications for corporate security are immense - where users hardly ever back up material on their laptops, mere proximity to their desk will make it happen.

Applications such as this provide the first wave of Bluetooth opportunities, which were well understood by the developer community. A lot of the conference was spent in looking at what can come next, and the expected development of markets and specification.

Atlanta provided the chance to examine the standard and discuss possibilities, as well as showing early demonstrations of what has already been achieved. It was the first chance for the developer community to comment on where the original five have brought us: to endorse that progress and for a new tier of adopters to promote their wares and the vision for the path forward. We now know the route ahead and the players who will facilitate our travelling down that route.

THE DEVELOPMENT PROCESS STARTS...

First came the concept, then the public acclamation. Next the clamour to be present at the party and finally the first drafts of the standard. What's needed next is the ability to manufacture, not just for the initial promoters of any standard, but also for a much wider base of companies. We've seen standard proposals appear, gain momentum and then fail unless it becomes possible for a mass market to emerge. With Bluetooth, the general development community has had nine months wondering how they would be able to implement the products. They flocked to Atlanta to find out how. Some of those hopes were realised.

The most significant step for most adopters of Bluetooth was the publication of Version 0.7 of the standards a fortnight before the Atlanta meeting. Prior to this all that was available was the earlier 0.6 version and the initial concept document, which gave little detail on implementation, limiting themselves to Baseband and Link Manager. Version 0.7 started to fill in the gaps and explain how Bluetooth would be formed. At the conference some of the first participants began to show how they would play a part in rolling out products.

Key to Bluetooth is a low cost and efficient radio and baseband section - Bluetooth is, after all, essentially a radio link. Both Nokia and Ericsson were demonstrating real implementations of Bluetooth radios, with Ericsson publicly launching details of a complete RF module which would be made available during 1999 to licensees. Prior to the conference, Lucent had announced its intention of offering a silicon front end, and during the course of the week Harris also entered the list of silicon vendors with anticipated products. The list of delegates was well represented with RF and Baseband silicon vendors, so the coming months should add at least a few more to this opening line-up.

Closer to Ericsson, VLSI are starting a program to integrate the Ericsson technology into a Bluetooth development framework, along with their ARM processor cores, with the aim of moving to a single chip solution, particularly aimed at the embedded market. Intel made no commitments on their earlier promise of a motherboard module for laptop and PC vendors, but are obviously heavily involved in development of Bluetooth. Throughout there is an impetus to drive the price down, both through economies of scale and density of integration.

For companies eager to enter the Bluetooth arena, but without the necessary hardware and software expertise, two of the Cambrdge-based technology houses are offering routes to market. Symbionics is working in conjunction with Ericsson to provide a Developers' Kit for Bluetooth. This will include an Ericsson Radio Module and Baseband processor on an evaluation board with USB and RS232 ports, along with Host software for Windows '98 and comprehensive documentation and antenna design information. Cambridge Consulting are also promising bespoke Bluetooth development, from single chip design to full product.

In the sidelines are a host of other consultancies eager to offer bespoke software and designs, all feverishly reading their version 0.7 specs and trying to guess the contents of the next two versions before we see the final 1.0 open release in the first half of 1999. Nokia, Ericsson, Toshiba and IBM have already openly stated that they will be implementing Bluetooth in their products, and a growing number of Far Eastern PDA manufacturers are including Bluetooth connectivity as a requirement on new product designs. Atlanta has put the technology firmly under starter's orders. The flag is up and the race is about to begin.

CORDLESS HEADSET SHOWN BY ERICSSON

At the recent Mobile Data Comm.s '98 show, held at London's Earls Court 2 exhibition centre, Ericsson introduced what it described as its first Bluetooth concept product. The company was demonstrating a cordless headset that was linking wirelessly to a standard Ericsson GSM mobile phone.

The Bluetooth headset was a one-piece affair that clips behind the wearer's ear. There was a small microphone attached that would enable the user to speak in a total hands-free manner. The receiving end of the connection was a pod that clips into the base of the Ericsson handset. In fact, the casing was identical to the one used for Ericsson's D127 infrared modem. Part of the reason for this choice is that units such as the D127 will retrofit a large number of Ericsson's existing handsets. According to Colin Ellis, data manager for mobile phones with Ericsson Limited, no decision as to whether or not the cordless headset will become an available product has yet been made. However, he hinted that the fact that it would retrofit increased the product's chances of eventual full production.

Ericsson would only say that the cordless headset was utilising technology it already possessed. It would make no comment on how closely that technology conformed to specification 0.7 of the Bluetooth standards.

The announcement also included the claim that Ericsson had 'contributed the basic radio expertise to Bluetooth which should, of course, give the company an edge in bringing products to market. In truth the wireless headset was not the first Bluetooth product shown by Ericsson. That honour went to the Concept One wristwatch which used Bluetooth to synchronise with an MC12 PDA. The watch was shown to journalists at Bluetooth's official launch back in May.

WIDER ASPECTS OF BLUETOOTH ARE BEING MISSED?

The broader aspect of Bluetooth applications are being missed, says Andrew Till, technology strategist at Psion Dacom, a member of the Bluetooth consortium. "The crop of applications being promoted at the moment are just scratching the surface."

According to Till, potential users of Bluetooth technology are aware of the benefits but many, both inside and outside the PC community, are unaware of just how far-reaching its implementations could be. "Using a phone equipped with Bluetooth technology is one of the most keenly anticipated applications amongst customers," he said. "Whether it's to transfer data between phones, to synchronise data with a PC or PDA, to access a modem or to connect to a Bluetooth/PSTN adapter for wireless telephony in the home. People know what's coming and they want to get hold of it."

The more esoteric uses for Bluetooth have, however, been overlooked so far. Andrew Till believes Bluetooth could be used in cars to replace wiring and to perform such everyday applications as controlling electric windows. Additionally a Bluetooth key-fob could be used to operate the car's door locks, immobiliser or stereo. The same holds true in the home where it could be used to replace wiring between separate hi-fi units or between the stereo system and the speakers. "Technologies such as DECT and Wireless LAN already provide connectivity on the hardware side," added Till. "What is truly attractive about Bluetooth is that it needs both hardware and software to work together. I suspect that might prove to be a bigger task than some people anticipate."

BLUETOOTH WIRELESS MUSIC CENTRE?

A UK based modem manufacturer has told Incisor that it is planning to produce a Bluetooth enabled car entertainment system. The project stems out of R&D work it has previously done on DECT based modems. The UK product will build on the existing concept of combined hands-free and music centres already offered in the German market. Other aspects of the Bluetooth centre are modelled on an in-car GSM handset produced for the Italian market by Italtel. That product has an LCD screen which is used to display both telephone numbers and SMS text messages. It accepts the user's SIM card via a pop-out drawer.

The Bluetooth project intends to combine both these two elements and offer a music centre that switches off and becomes a hands-free system once an incoming call is detected. Existing products rely on the user inserting his or her mobile handset into a cradle on entering the car. The advantage to using Bluetooth instead of a direct connection will be that the centre can be sold into all global markets and will work with a variety of makes of handset. The modem company is presently seeking a partner to work with on this project and has yet to produce a working prototype.

THE WIRELESS VISION ACCORDING TO ERICSSON

Ericsson's new SH888 mobile phone (mobile.ericsson.com/sh888) is the first phase of a development that will revolutionise the way we work. Instead of connecting your computer to a network, either the fixed network where you work or via cable to the computer from a GSM mobile phone network, you will now communicate entirely without wires. This is what Bluetooth is about. Actually, Bluetooth is several things at once. It is both hardware and software. The hardware is a radio - a transmitter and a receiver. The radio can be located in a mobile phone, in a laptop or in an adapter that you plug into the fixed network where you work. Using the software, the mobile phone can communicate with the computer at a distance without wires - but using radio waves instead of infrared light. The dream of a cordless society will be a reality toward the end of next year, and by then slow data transmission via a GSM network will be a fading memory - data transmission will be substantially faster thanks to new technology.

SYMBIONICS TO BUILD BLUETOOTH DEVELOPER'S KIT

UK developer Symbionics Ltd has been chosen by Ericsson to lead the design, distribution and support of a Bluetooth developer's kit, which will enable manufacturers to design Bluetooth wireless technology into new products.

Symbionics will work to have the kits ready for distribution early next year - in advance of the first Bluetooth products coming to market before the end of 1999.

Business manager Tim Hughes said: "We are extremely pleased to have been appointed by Ericsson to work right at the heart of Bluetooth technology development. Work on the developer's kit will enable us to get a head start in the development of Bluetooth products. It is therefore our intention to establish a service alongside this project geared to providing product design services for early adopters of the technology."

Symbionics has extensive design services experience across a range of wireless standards, particularly IEEE802.11, the HomeRF group's SWAP protocol, and DECT.

The developer's kit, consisting of various hardware and software tools, enables users to design products and develop applications using Bluetooth modules, components and software.

ARM LENDS A HAND

ARM, best known as a developer and provider of licenses for high-performance, low-cost, power-efficient RISC processors has announced its support of the Bluetooth program. As a member of the Early Adopters program, ARM states that it is actively working to support the core technology together with the five founding members.

ARM spokesman Pete Magowan commented "ARM believe the Bluetooth initiative is a significant milestone in the mobile communications industry. ARM will apply its expertise in high performance, low power microprocessor design to create intellectual property that implements the Bluetooth specification."

Arm's announcement has led to industry speculation over the role to be played by this new member of the SIG. With Intel's stated intention of carrying out much of the Bluetooth silicon development (see separate story), it would seem that there is as potential area of conflict.

ARM counters this with by saying that it also provides comprehensive support in developing a complete system. Apparently, ARM's microprocessor cores are rapidly becoming the volume RISC standard in such markets as portable communications, hand-held computing, multi-media and embedded solutions.

What is certain is that the Bluetooth playing field will be big enough to ensure that many teams can compete. ARM is a global company with partnerships with most of the industries major players, including IBM, Lucent, VLSI and Rockwell, as well as Intel. There is evidence here to say that ARM will find a comfortable and profitable position within the Bluetooth SIG.

TDK REPORTS HIGH LEVEL OF INTEREST

TDK Systems, one of the first ten companies to join the Bluetooth SIG, has reported very high levels of interest in Bluetooth development.

The company recently launched a dedicated area on its web-site - www.tdksys.com/bluetooth -- to cover its own developments in this area plus general information concerning Bluetooth. TDK's current areas of business include the development and manufacture of PC Card and "soft" GSM modem products for the mobile computing sector.

Nick Hunn, head of R & D and product development guru at TDK's European development centre in the UK said "Last week we had 276 Bluetooth hits on our web site. The interest is out there."

Hunn went on to say that TDK is well positioned to establish a leading position in the Bluetooth sector due to its European GSM experience and excellent relationships with Nokia and Ericsson. These were built-up while TDK worked with the two companies to produce licensed hardware and software data solutions for GSM handsets produced by the two Bluetooth founders.

Bluetooth is likely to be a highly competitive environment. From an editorial standpoint it will be interesting to see which companies make it first to the high ground.

INTEL SPECULATES OVER BLUETOOTH PRICING

Inevitably, the world's leading silicon company has become involved in Bluetooth. Intel was a founder member of the group and clearly sees the potential for the new technology. But while others speculate over blue skies and long-term scenarios, Intel seems to be keen to put stakes in the ground on just how much adding Bluetooth will cost those companies planning to put the chip into their devices.

As usual, silicon development costs will load the price for early adopters, with Intel currently suggesting that companies should factor in a rather broad spread of $20 to $30 to add Bluetooth. Normal factors apply, and so when the volumes go up, the price comes down, to less than $10 within one year of chip shipments commencing. At least, this is Intel's guideline at this point.

A warning is made that it will also be necessary to consider other costs. Intel suggests that driver development and RF communications stack costs will be passed on to OEM customers. It doesn't take a genius to work out that the OEM will subsequently pass this on to the end customer. This means that in the initial stages, early adopters will pay through the nose for Bluetooth-enabled products. As with any new technology, the buyers who wait until the market settles will pay nearer to the real mark-up for what should be a relatively inexpensive add-on.

What is slightly surprising is that despite the fact that there are more than 240 Bluetooth SIG members, Intel will be doing much of the development. This includes a radio module and companion chip set for use in PCs, Windows drivers and a communications stack. To show that this is a here and now technology, Intel has demonstrated file transfer between a notebook and cellular phone using a PC Card radio module.
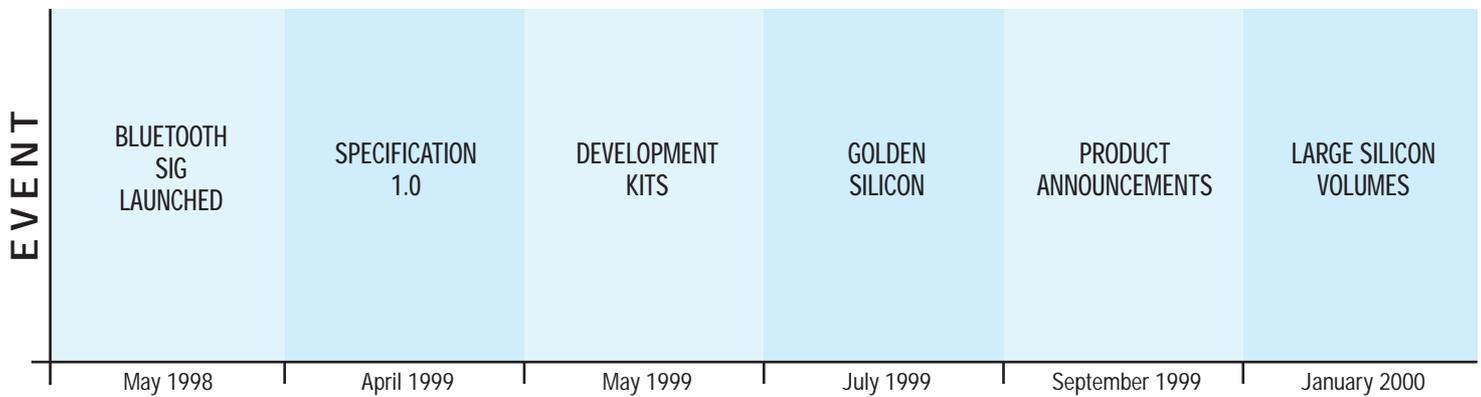
BLUETOOTH CALENDAR OF EVENTS

DATE	EVENT	LOCATION	NOTES	LINK
November 30 - December 5	Mobile Internet	London	-	-
February 23-25	Cannes GSM World Conference	Cannes	-	http:www.gsmworldcongress.com/
March 18-24	Cebit	Hannover	-	http://www.messe.de/cb99/index e.html
October 26-27	Mobile Handset Development 1998	London	Speech by Örjan Johansson - Embedded short link radio - effect on usage.	http://www.iir-conferences.com/handset2.html
January 13-15 1999	3G Mobile	Coral Gables	-	-

Further Bluetooth events will be added to the calendar as soon as they are announced. See notes below regarding editorial submissions.

PRODUCT ROLLOUT

At the time of print, this was the expected scheduling for the rollout.

E V E N T	BLUETOOTH SIG LAUNCHED	SPECIFICATION 1.0	DEVELOPMENT KITS	GOLDEN SILICON	PRODUCT ANNOUNCEMENTS	LARGE SILICON VOLUMES
	May 1998	April 1999	May 1999	July 1999	September 1999	January 2000

INCISOR

CONTACT DETAILS:
Commercial & Editorial:
Vince Holton
vholton@click.co.uk
Telephone: +44 (0)1256 701646

This newsletter is distributed on a monthly basis to companies and individuals with an interest in Bluetooth technology.

Should you wish to stop receiving Incisor, then please contact Click I.T. Ltd using the contact details shown.

Editorial contributions are welcomed. Companies should send press releases to the editorial contact across.

Individuals are invited to express their views as to the content and style of Incisor.