ALTERNATIVE MEDICINE BILL BECOMES LAW IN ONTARIO, CANADA
On 21 December 2000 an historical event occurred in the Province of Ontario in Canada! The following, entitled “Bill 2, An Act to Amend the Medicine Act, 1991,” was passed unanimously by the Provincial Parliament of Ontario:

“A member (of the College of Physicians and Surgeons) shall not be found guilty of professional misconduct or of incompetence under Section 51 or 52 of the Health Professions Procedural Code solely on the basis that the member practices a therapy that is non-traditional or that departs from the prevailing medical practice unless there is evidence that proves that the therapy poses a greater risk to a patient’s health than the traditional or prevailing practice.”

This is exciting news, indeed, especially in light of the recent information demonstrating that reliance on “traditional” medicine has resulted in placing the United States at the bottom of the list in health status amongst the advanced nations of the world. [see BPNL, 17(1):1-3, January 2001] Perhaps the new bill in Ontario will encourage consideration of non-traditional therapies throughout Canada and in the United States.

The discussion of Bill 2 provided some very interesting comments by Ontario legislators:

* In Europe, St. John’s Wort, a botanical used
to treat mild to moderate depression, is outselling Prozac by leaps and bounds.

* Hamilton's McMaster University has proposed a $100-million center for complimentary medicine......amalgamating research into western and eastern treatments while investigating the roles that lifestyle and diet play in keeping Canadians healthy.
* Nearly 50% of Canadians are using some form of alternative therapy.
* A survey of Canadians' attitudes towards alternative medicine found that 66% feel that the government should be advocating the use of alternative medicine and practices in order to potentially reduce the costs to the health care system.

Resistance from the Ontario College of Physicians and Surgeons had resulted in failure to pass the bill on the first two tries. However, the following letter from that society was read into the record this time: "Your bill comes at a time when there is even more urgent need to improve the knowledge and experience of the medical profession in the area of non-traditional medicine. The public will be best served by a medical profession that can take a careful, objective look at various forms of alternative medicine, to best advise our patients. Our long-range goal should be to critically evaluate complementary therapies in the same way we are assessing traditional medicine, in order to provide the safest, most cost-effective and beneficial treatments."

The bottom line - providing the safest, most cost-effective and beneficial medical treatment possible! It is clear from the information provided in the last newsletter that this goal has not been achieved in the United States, in spite of the vast amounts of expenditures devoted to that goal. It is time that the "traditional" medical and dental establishments must broaden their vistas and open their minds to alternative approaches. In a way, it is sad that it takes government action to point this out.

[Bio-Probe, Inc. thanks Wayne Obie (communications@talkinternational.com) for providing this information. Mr. Obie is known as the person who spearheaded the class action suit against dental amalgam in Canada.]

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STARTLING DISCOVERY!
THE ORAL CAVITY IS PART OF THE BODY!
[Editors Note: The following quotations are from a recent article entitled "Oral Reports" in The Sciences, pages 25-39, Nov-Dec 2000. The authors were Robert J. Genco (dentist and immunologist at SUNY, Buffalo), Frank A. Scannapieco (dentist and microbiologist at SUNY, Buffalo), and Harold C. Slavkin (Dean of USC School of Dentistry and former Director of the National Institute of Dental and Craniofacial Research of NIH). Bio-Probe is grateful to Dr. Chester Yokoyama of IAOMT for providing this article.]

OR: (p. 26, col. 1) "Investigators have made a startling discovery: the state of the teeth and gums turns out to be integrally related to the health of the entire body."

BP: What an amazing revelation! This heretic position flies in the face of the various dental boards, who persist in disciplining biological dentists for "practicing medicine without a license." Leaders of organized dentistry have persistently taken the position that dentists are not qualified to consider the systemic health consequences of the treatment that they render to their patients.

Dentistry has long been functioning independently of the rest of the medical profession. This unfortunate situation has resulted in dentistry being focused on technical quality, rather than health. In a proper prospective, dentistry should be a specialty within the medical profession. Every dental school should have biologists and toxicologists on staff. Hopefully, this trend has begun.

OR: (p. 26, col. 2) "Oral bacteria release toxic products that damage gum tissue, but the harm the bacteria cause directly is nothing compared with the destruction they induce the body to inflict on itself." - and - (p. 30, col. 2) "In the future, dentists may also take on part of the management of diabetes, screen patients for
hearth disease and monitor the patients’ calcium levels.”

BP: This statement is, of course, based on solid published research, much of which is cited in the article. As this position becomes more accepted throughout the medical community, (some) dentists will assume their proper role as specialists in “Oral Medicine and Toxicology.” This brings us to -

OR: (p. 25, col. 2) “After centuries of incremental advances, however, dentistry is on the brink of exponential change. The profession is moving away from the construction paradigm - building bridges and crowns, filling holes - and into the realm of molecular biology and biotechnology.”

BP: To see this in print, written by establishment dentists, is very gratifying. Long years of struggle and sacrifice by biological dentists may be reaching fruition. Some dental organizations, almost entirely alternative, have been taking this approach for years. Members of these organizations will benefit, while traditional “drill and fill” dentists will either fall by the wayside or become technicians employed by dentists competent in oral medicine and toxicology. Dentists must decide for themselves which course they would like to take. Graduation from dental school and passing the state board may no longer be sufficient. Even membership alone in one or more of the alternative dental organizations will probably be insufficient. Dentists must avail themselves of the meetings and other educational opportunities offered by these organizations.

Further, biological dentists must commit themselves and their practices to the standards of care developed by these organizations, especially regarding periodontal therapy. However, care must be taken to ensure that these standards are based on documented evidence. The paradigm has not yet fully shifted in the minds of the dental boards.

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SCIENCE

Exposure to Toxic Elements Via Breast Milk.
Oskarsson, A; Palminger H I; Sundberg, J. Analyst, 120(3):765-70, Mar 1995.

ABSTRACT: Breast Milk is the ideal nutrient for the newborn, but unfortunately also a route of excretion for some toxic substances. Very little attention has been paid to breast milk as a source of exposure to toxic elements. The dose-dependent excretion in breast milk and the uptake in the neonate of inorganic mercury, methyl mercury and lead were studied in an experimental model for rats and mice. The transfer of mercury from plasma to milk was found to be higher in dams exposed to inorganic mercury than to methyl mercury. In contrast, the uptake of mercury from milk was higher in the sucklings of dams exposed to methyl mercury than to inorganic mercury. Pre- and postnatal exposure to methyl mercury resulted in increased numbers and altered proportions of the thymocyte subpopulation and increased lymphocyte activities in the offspring of mice and also effects on the levels of noradrenaline and nerve growth factor in the developing brain of rats. Mercury in blood and breast milk of lactating women in Sweden was studied in relation to the exposure to mercury from fish and amalgam. Low levels were found; the mean levels were 0.6 ng/g(-1) in milk and 2.3 ng/g(-1) in blood. There was a statistically significant correlation between mercury levels in blood and milk, showing that milk levels were approximately 30% of the levels in blood.

Inorganic mercury exposure from amalgam was reflected in blood and milk mercury levels. Recent exposure to methyl mercury from consumption of fish was reflected in mercury levels in the blood, but not in milk.

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Total and Inorganic Mercury in Breast Milk in Relation to Fish Consumption and Amalgam in Lactating Women.
Oskarsson, A; Schultz, A; Skerfving, S; Hallen, IP; Ohlin, B; Lagerkvist, BJ.
ABSTRACT: Total mercury concentrations (mean +/- standard deviation) in breast milk, blood, and hair samples collected 6 wk after delivery from 30 women who lived in the north of Sweden were 0.6 +/- ng/g (3.0 +/- 2.0 nmol/kg), 2.3 +/- 1.0 ng/g (11.5 +/- 5.0 nmol/kg), and 0.28 +/- 0.16 microg/g (1.40 +/- 0.80 micromol/kg), respectively.
In milk, an average of 51% of total mercury was in the form of inorganic mercury, whereas in blood an average of only 26% was present in the inorganic form. Total and inorganic mercury levels in blood (r = .55, p = .003; and r = .46, p = .016; respectively) and milk (r = .47, p = .01; and r = .45, p = .18, respectively) were correlated with the number of amalgam fillings.
The concentrations of total mercury and organic mercury (calculated by subtraction of inorganic mercury from total mercury) in blood (r = .59, p = .006, and r = .56, p = .001, respectively) and total mercury in hair (r = .52, p = .006) were correlated with the estimated recent exposure to methyl mercury via intake of fish. There was no significant correlation between the milk levels of mercury in any chemical form and the estimated methyl mercury intake.
A significant correlation was found between levels of total mercury in blood and in milk (r = .66, p = .0001), with milk levels being an average of 27% of the blood levels. There was an association between inorganic mercury in blood and milk (r = .96, p < .0001); the average level of inorganic mercury in milk was 55% of the level of inorganic mercury in blood.
No significant correlations were found between the levels of any form of mercury in milk and the levels of organic mercury in blood.
The results indicated that there was an efficient transfer of inorganic mercury from blood to milk and that, in this population, mercury from amalgam fillings was the main source of mercury in milk. Exposure of the infant to mercury from breast milk was calculated to range up to 0.3 microg/kg x d, of which approximately one-half was inorganic mercury. This exposure, however, corresponds to approximately one-half the tolerable daily intake for adults recommended by the World Health Organization. We concluded that efforts should be made to decrease mercury burden in fertile women.

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Lactational Exposure and Neonatal Kinetics of Methylmercury and Inorganic Mercury in Mice.
Sundberg, J; Jonsson, S; Karlsson, MO, Oskarsson, A.
ABSTRACT: The concentration of mercury in milk and the distribution pattern in the sucking pup was followed over time after administration of a single iv injection of 0.5 mg/kg body wt of 203Hg-labeled methyl mercury chloride or mercuric chloride to lactating mice on day 10 of lactation. Mercury concentrations in milk of the dams and in whole body, blood, plasma, GI-tract, liver, kidneys, and brain of the offspring were followed up to 11 days after dosing (until lactational day 21).
Following the inorganic mercury dose to the dams, most of the mercury in milk was delivered to the pups during the first 24 h, but the maximum mercury concentration in plasma and tissues of pups was not reached until 7 days after dosing, indicating a prolonged absorption of inorganic mercury in the sucking pup.
Pups of dams given methyl mercury were exposed to a much lower and constant mercury concentration in milk. The estimated accumulated mercury dose via milk per pup of dams given methyl mercury was less than half of
that estimated after the inorganic mercury dose. When the accumulated dose via milk from methyl mercury-exposed dams was compared to the amount of mercury in pup’s carcass (whole body minus GI-tract including content), it was revealed that almost all mercury delivered via milk was absorbed, and that the suckling pups had a very low elimination of mercury until lactational day 17.

Lactational exposure following a maternal methyl mercury or inorganic mercury dose resulted in almost similar mercury concentrations in liver, kidneys, and plasma of the suckling, but higher concentrations in brain (almost 14 times) and also twice as high mercury body burden in the methyl mercury group. Thus, differences in kinetics indicate that lactational exposure of methyl mercury is a greater hazard for the breast-fed infant than inorganic mercury.

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Environmental Contaminants in Human Milk.
Anderson, HA; Wolff, MS.
ABSTRACT: Environmental contaminants can be stored in the mother’s body or can be transiently present from current diet, occupational exposures or personal habits. These chemicals can be transferred prenatally to the developing fetus or postnatally from breast milk to the nursing infant. Exposures through breast milk can be substantial, especially when the mother has significant ongoing exposures or has accumulated an unusually high body burden of persistent chemicals.
Several studies demonstrate that organochlorines (Ocs) acquired from breast milk elevate a child’s body burden for several years. The decline of persistent OC residues in Western countries suggests that these exposures through breast milk will also diminish.
Heavy metals such as lead and mercury are also present in milk, but the pharmacokinetics are quite different from OCS. Less persistent environmental agents, including solvents, polycyclic aromatic hydrocarbons, certain pesticides, and nicotine, can also be detected in milk. There is little information on currently used pesticides and other more recently identified environmental agents for which exposures are common today.
Epidemiologic research has established that pre- and postnatal exposures to environmental contaminants including lead and OCs are associated with developmental deficits in early childhood. Therefore, characterization of these contaminants in breast milk can add to our knowledge of potential environmental exposures among children.

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Distinct Pattern of Neuronal Degeneration in the Fetal Rat Brain Induced By Consecutive Transplacental Administration of Methyl Mercury.
Kakita, A; Wakabayashi,K; Su, M; Sakamoto, M; Ikuta, F; Takahashi, H.
ABSTRACT: The transplacental neurotoxicity of methyl mercury (MeHg)on the fetal rat brain was studied. Adult female rats were administered 1, 2 or 3 mg/kg/day methyl mercury chloride (MMC) orally for either 5 or 12 days, and were then mated. They were subsequently administered MMC in the same manner until the end of gestation.
On embryonic day 22, a proportion of the fetal brains were histologically examined. Neuronal degeneration of varying degree was detected consistently in the brain stem, cingulate cortex, thalamus and cerebral basal area, including the hypothalamus. The distribution pattern of neuronal damage was different from those in rats treated with MeHg in the postnatal or adult stages.
This finding suggest that pathomechanisms in
MeHg intoxication operate distinctively in the fetal brain. The offspring derived from dams treated with 1 mg/kg/day MMC for 5 pregestational days and throughout pregnancy survived with inherent brain lesions. The experimental model could be a useful tool for research on the neurotoxicity of MeHg in the Human fetal brain.

[Bio-Probe Note: In the July 1998 edition of this newsletter (Vol. 14, Issue 4), abstracts of 23 studies demonstrating transfer of mercury from amalgam fillings of pregnant females into fetal tissues and into mothers’ milk, and/or adverse effects of prenatal and early postnatal mercury exposure were presented. These preceding 5 studies provide further evidence. All of these studies are especially vital to the current concern over mercury exposure as a cause of autism.]

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Aging Unmasks Adverse Effects of Gestational Exposure to Methylmercury in Rats.
Newland, MC; Rasmussen, EB.

ABSTRACT: The consequences of developmental exposure to methyl mercury on behavior in aged animals were investigated. Methyl mercury exposure was arranged by placing 0, 0.5 or 6.4 ppm Hg in the drinking water of female rats at least 4 weeks before mating and continuing until post-natal (PN) day 16.

Brain Hg concentrations in cohorts of low- and high-dose offspring were 0.5 and 9.1 ppm at birth and 0.04 and 0.52 ppm at weaning (described in another report). Lever pressing of female offspring was maintained under a Multiple Differential Reinforcement of High Rate 9:4 Extinction schedule of food reinforcement (Mult DRH 9:4 EXT). Under the DRH 9:4 schedule, a food reinforcement was delivered when nine responses occurred within 4 s. Under the Extinction schedule, responding had no programmed consequences.

No exposure-related differences in reinforcement rate under the DRH schedule or discrimination between the DRH and extinction components were apparent initially. At 950 days of age, the overall response rates of controls had shown a gradual decline over the previous 500 days to about 80% of their beginning levels, but, otherwise, most controls were healthy. A gradual decline in the reinforcement rate began to appear in low- and high-dose rats at about 500 and 800 days of age, respectively.

Microanalyses of the nine-response burst maintained by the DRH schedule revealed that the lever-press duration increased, the inter-response time (IRT) was unaffected, and the time between response bursts increased. Overall, the nine-response burst remained intact as a coherent unit.

The increased time between response bursts caused the decline in reinforcement rate. All rats displayed these effects as they aged, but the mercury-exposed rats did so sooner.

Bio-Probe Comment: This study demonstrates that adverse effects of prenatal and early postnatal exposure to both low- and high-dose mercury may appear later in life.

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Toxicology of Choroid Plexus: Special Reference to Metal-Induced Neurotoxicities.
Zheng, W.

ABSTRACT: The chemical stability in the brain underlies normal human thinking, learning, and behavior. Compelling evidence demonstrates a definite capacity of the choroid plexus in sequestering toxic heavy metal and metalloid ions. As the integrity of blood-brain and blood-CSF barriers, both structurally and functionally, is essential to brain chemical stability, the role of the choroid plexus in metal-induced neurotoxicities has become an important, yet under-investigated research area in neurotoxicology.
Metals acting on the choroid plexus can be categorized into three major groups. A general choroid plexus toxicant can directly damage the choroid plexus structure, such as mercury and cadmium.

A selective choroid plexus toxicant may impair specific plexus regulatory pathways that are critical to brain development and function, rather than induce massive pathological alteration. The typical examples in this category include lead-induced alteration in transthyretin production and secretion as well as manganese interaction with iron in the choroid plexus. Furthermore, a sequestered choroid plexus toxicant, such as iron, silver, or gold, may be sequestered by the choroid plexus as an essential CNS defense mechanism.

Our current knowledge on the toxicological aspect of choroid plexus research is still incomplete. Thus, the future research needs have been suggested to focus on the role of choroid plexus in early CNS development as affected by metal sequestration in this tissue, to explore how metal accumulation alters the capacity of the choroid plexus in regulation of certain essential elements involved in the etiology of neurodegenerative disease, and to better understand the blood-CSF barrier as a defense mechanism to overall CNS function.

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Bacterial Invasion in Root Cementum and Radicular Dentin of Periodontally Diseased Teeth in Humans: A Reservoir of Periodontopathic Bacteria.
ABSTRACT: In this study the viability and the distribution of bacteria within the radicular dentin and pulp of periodontally diseased caries-free teeth were studied. Healthy teeth served as controls. Samples were obtained from the pulp tissue and from the radicular dentin. Dentin samples were taken from the interdental surfaces in the subgingival area.

Starting from the pulpal side, three to five successive dentin layers of approximately 1 mm thickness were sampled. The samples were processed and cultured using an anaerobic technique. Bacterial growth was detected in 87% of the periodontally diseased teeth. In 83% of the teeth, bacteria were present in at least one of the dentin layers. Fifty-nine percent of the diseased teeth, from which the pulp tissue was cultured, contained bacteria in the pulp samples.

The mean bacterial concentrations in the pulp and dentin layers ranged from 1,399 to 16,537 colony-forming units (CFU) per mg of tissue. These concentrations were 259 to 7,190 times greater than concentrations found in healthy teeth.

It is suggested that the roots of periodontally diseased teeth could act as bacterial reservoirs from which recolonization of mechanically treated root surfaces can occur, as well as infection of the dental pulp. These findings might change current concepts concerning root surface debridement in periodontal therapy.

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Ultrastructural Observations on Bacterial Invasion in Cementum and Radicular Dentin of Periodontally Diseased Human Teeth.
ABSTRACT: In this study the bacterial invasion in root cementum and radicular dentin of periodontally diseased, caries-free human teeth was examined. In addition, structural changes in these tissues, which could be related to the bacterial invasion, were reported. Twenty-one caries-free human teeth with extensive periodontal attachment loss were studied by light and scanning electron microscopy.

At the base of the gingival pocket, bacteria were found in the spaces between remnants of Sharpey's fibers and their point of insertion in the cementum. In teeth that had been scaled and root planed, most of the root cementum had been removed. Bacterial invasion was found in the remaining root cementum. The invasion seemed to start as a localized process, often involving only one bacterium. In other areas bacteria were present in lacunar defects in the
cementum. These lacunae extended into the radicular dentin.
In 11 teeth bacteria had invaded the dentinal tubules. Most bacteria were located in the outer 300 microns of the dentinal tubules, although occasionally they were found in deeper parts. In two of the nontreated teeth, bacteria were detected on the pulpal wall. No correlation was found between the presence of bacterial invasion and the absence of radicular cementum. No bacteria were found in the portion of the root located apically to the epithelial attachment. These data are in agreement with our results from cultural studies of the bacterial flora in these structures. It was also demonstrated that in spite of meticulous scaling and root planing and personal oral hygiene, bacterial plaque remained present on radicular surfaces. Both the invaded dentinal tubules and the lacunae could act as bacterial reservoirs from which recolonization of treated root surfaces occurs. From these reservoirs bacteria could also induce pulpal pathoses. Since these bacterial reservoirs are not eliminated by conventional mechanical periodontal treatment, it seems appropriate to combine mechanical periodontal therapy with the use of chemotherapeutic agents.

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Structural Basis of the Antagonism Between Inorganic Mercury and Selenium in Mammals.
Gailer, J; George, G; Pickering, I; Madden, S; Prince, R; Yu, E; Denon, MB; Younis, H; Apostian, HV.
ABSTRACT: Mercuric chloride toxicity in mammals can be overcome by co-administration of sodium selenite. We report a study of the mutual detoxification product in rabbit plasma, and of a Hg-Se-S-containing species synthesized by addition of equimolar mercuric chloride and sodium selenite to aqueous, buffered glutathione. Chromatographic purification of this Hg-Se-S species and subsequent structural analysis by Se and Hg extended X-ray absorption fine structure (EXAFS) spectroscopy revealed the presence of four-coordinate Se and Hg entities separated by 2.61 Å.
Hg and Se near-edge X-ray absorption spectroscopy of erythrocytes, plasma, and bile of rabbits that had been infected with solutions of sodium selenite and mercuric chloride showed that Hg and Se in plasma samples exhibited X-ray absorption spectra that were essentially identical to those of the synthetic Hg-Se-S species. Thus, the molecular detoxification product of sodium selenite and mercuric chloride in rabbits exhibits similarities to the synthetic Hg-Se-S species. The underlying molecular mechanism for the formation of the Hg-Se-S species is discussed.

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FORUM
IAOMT 2001 MID-YEAR MEETING
SITE: Las Vegas, Nevada.
HOTEL: Tropicana Hotel; 3801 Las Vegas Blvd., S. Las Vegas, NV 89109. T: 702-739-2222 or 800-634-4000. Specify IAOMT. Room rate: $119/night Friday/Saturday, $59/night Thursday; s/d.
WELCOME RECEPTION (Cash bar): Thursday, 8 March 2001, 7:30pm.
PROGRAM:
Thomas E. Baldwin, DDS: "Biological Periodontal Therapy."
Russ F. Borneman, DDS: "Equipping the Biological Dental Office."
Stephanie Cave, MD: "Chelating Mercury From Autistic Children."
Richard J. Chanin, DMD: "Fundamentals of Biological Dentistry."
Peter H. Duesberg, PhD: "A Challenging Perspective on HIV/AIDS."
Boyd E. Haley, PhD: "The Biochemistry of Dental Mercury."
Richard T. Hansen, DMD: "Lasers in Dental Therapy."
David Kennedy, DDS: "Fluoridation Update."
Hardy Limeback, BSc, PhD, DDS: "Scientific Facts on Fluoridation."
John Roberts, BDS: "Digital Radiography."