The European Association of Nuclear Medicine (EANM) Congress 1990 was held from May 20-24 in Amsterdam, The Netherlands. Close to 1,300 physicians, scientists, and technologists from 41 countries attended the meeting. Stanley J. Goldsmith, MD, associate editor, Newsline, excerpted the following from the summary of the Congress' highlights given by Peter Ell, MD, from University College and Middlesex Schools of Medicine, in London, United Kingdom.

The 1990 EANM Congress Program, which was compiled from over 1120 submitted abstracts, included 268 oral presentations, almost 400 poster presentations, and a major exhibition with 47 exhibiting companies. The scientific program had 45 scientific sessions, 17 plenary lectures, 251 free papers, and 17 works-in-progress papers. For the first time, the EANM Congress presented a technologist program, with 12 scientific sessions, 25 plenary lectures, 28 free papers, and 1 workshop. Selected poster presentations were brought into the lecture theaters through video projection techniques.

Comparing this year's Congress to the 1989 EANM Congress in Strasbourg, France in his highlights summary, Dr. Ell said, "again the major work comes from Europe, which is natural. But we spread our interest far wider than that, and we have a significant participation from our friends and colleagues from North America, Asia, and the rest of the world... The main theme, which kept coming up in almost every session, is the significant advance in our radiopharmaceuticals... It is dependent on the outcome of these tracers whether or not [nuclear medicine] will grow in an extremely significant fashion or only in a modest way.

"We have a whole range of new tracers, new tracers for cerebral perfusion, for neuroreceptor imaging, for amino acid [imaging], for kidney [studies], for cardiac perfusion studies, transit times, inflammatory and infection detection processes, and a whole range of tracers where monoclonal [antibodies] are... [attached to] technetium-99m [99mTc], indium-111 [111In], and... a most interesting tracer... interleukin-2 [IL-2] labeled with iodine-123 [123I].

"In the awakening of the new possibilities for nuclear medicine treatment," reported Dr. Ell, "we have a whole range of new possibilities. Treatment of terminal bone pain with [one of several] radionuclide[s]... and treatment of conditions such as neuroblastoma, hepatoma, and medullary carcinoma of the thyroid.

"Choice is of course better than no choice, but [too many] choice[s] can also lead to confusion," he noted. "We might be careful that we don't end up with cerebral confusion, rather than perfusion. There is a task to decide which tracers, for what purposes, in what sequence?... We cannot use all the tracers in the same patient. Dosemetric considerations will [also] restrict this approach. Choices will have to be made, and the market cannot stand the plethora [of agents]."

**PET Development**

In a review of instrumentation, Dr. Ell discussed some of the factors influ-
The development of positron emission tomography (PET). "I don't believe that there is any doubt...that the single most important issue [standing in the way] of the clinical widespread availability and applicability of PET is cost. Cost is the overriding issue which must be tackled. Two developments address this issue. One coming from the center of Europe with a little box that is going to give us oxygen-15 [\(^{15}\)O]; and one development, a brain scanner, based on sodium iodide detectors, comes from the United States. The joint application of these two will halve the present cost estimates for PET tomography of the brain...Task groups [within the European Economic Community (EEC)] will address the issues of PET performance evaluation...spatial resolution and recovery, sensitivity, non-uniformity, count rate performance, scatter fractions, and an EEC emission phantom...The group from London, looking at performance of PET scanners...noticed that the differences are not so much in spatial resolution, but that the major issue is still one of sensitivity." Some advanced PET systems have removed the septa between crystals to increase the solid angle of detection and, hence, the number of photons counted.

There is also "a clear trend" away from general purpose devices to dedicated devices, noted Dr. Eli. "...We were able to test one of these dedicated machines and demonstrate that we can gain a factor of three in terms of time for patient positioning, a factor of three for data acquisition whilst maintaining the spatial resolution, and gain almost a factor of three in planar sensitivity," he said.

Dr. Eli reported that Zito from the University of Milan, Italy compared full width half maximums (FWHM), slice thicknesses, and slice sensitivity for PET and single photon emission computed tomography (SPECT) instrumentation (No. 89). Presenting his own group's data along with Zito's, he noted, "there are wide variations in spatial resolution, wide variations in slice thickness, and therefore, wide variations in slice sensitivity. The point is that we need an EEC SPECT phantom that is calibrated to give us appropriate comparable figures of merit so that customers can decide on figures of merit [that] are meaningful.

"Another trend, which is most interesting, is the progressive application of simple computer systems," Dr. Eli noted. "Macintosh II [can be used for] nuclear medicine image acquisition, processing, and display." Reviewing data presented by Lear from the University of Colorado Health Sciences Center in Denver (No. 92), Dr. Eli noted that Lear used fluorine-18 (\(^{18}\)F) PET images processed on a Macintosh and concluded that "accurate, precise, and high-speed data acquisitions can be performed on the Mac; specifications exceed typical intrinsic gamma camera performance; clinical processing is rapid; speed is greater than most dedicated computers; user interface facilities are easy to use; and the quality of the images exceeds typical film quality" (Figures 1 & 2).

Dr. Eli also reported that deLima and his colleagues from the University of Aveiro presented a "most interesting study" that combined perfusion and ventilation in a single image (No. 202). Using histograms, the group "compared the usual V/Q ratio image with a three-dimensional histogram and concluded that this display of combined perfusion and lung function is easier to interpret and provides [more] information than the standard V/Q ratio study.

"Briefly, I would like to mention the importance of not only producing good images, but being sure that the images are acquired in an appropriate manner," said Dr. Eli, describing a study by Bourguignon, Syrota, and

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*Numbers refer to abstract numbers in the European Journal of Nuclear Medicine 1990; Volume 16, Number 7.*
colleagues from the SHFI, CEA in Orsay and Centre Hospitalier Regional et Universitaire (CHU) Henri Mondor in Créteil, France. The group presented $^{123}$I lisuride images processed with various filters: a Butterworth filter, a band pass phase, a Chang, and the Bellini reconstruction, using a transmission source (No. 54). Dr. Ell said, “The images are profoundly different [from each other, although] the [patient] data is the same. We must make sure that we optimize SPECT studies. I would like to see [a similar] study done on a cerebral perfusion agent such as $^{99m}$Tc HMPAO, and I would like to know the grey over white matter ratio [in each processed image].”

**Radioimmunoimaging**

Reporting on the pace of advancement in immunoscintigraphy, Dr. Ell said, “We would have wished immunoscintigraphy to progress more rapidly into a wide area of clinical application. After all, we began to conceive and look at the concept of protective antibodies in 1890. It was in 1975 that monoclonals were [first] produced, and in 1988 that we began re-shaping or humanizing antibodies by protein engineering. A major advance was recently reported in *Nature* from the MRC Molecular Biology Laboratory in Cambridge, United Kingdom [on] the issue of single domain antibodies: MABs versus DABs The advantages are clear. Specificity is maintained; there is no hypersensitivity to murine antibodies; and there is easier coupling to toxins and chemotherapeutic agents. The . . . problem to be solved remains that of possible lower affinity.

“At this conference step-by-step progress [in antibody imaging] was shown,” said Dr. Ell, reporting on several studies in this area. Khaw et al. from Massachusetts General Hospital in Boston and the Institute of Experimental Cardiology in Moscow, Union of Soviet Socialist Republics, examined the charges on these tracers and reported a reduction of the nontarget concentration (No. 7); Thakur from Thomas Jefferson University in Philadelphia, Pennsylvania presented a direct $^{99m}$Tc-labeling method utilizing ascorbic acid (No. 8); Westera led a Swiss collaborative group from University Hospital in Zürich, the Paul Scherrer Institut, Villigen, and the University of Lausanne, which studied a positron emitter to measure more accurately the dosimetric aspects of monoclonal antibodies (No. 12); Paganelli et al. from the University of Milan developed a “three-step system to improve signal-to-noise ratios with biotin and avidin and permit faster imaging after injection of the labeled antibody” (No. 13); and Attard et al. “demonstrated the concept of high dose, high-affinity antibodies adding dexamethasone to improve the signal-to-noise ratio and, hopefully, the image quality” (No. 14), said Dr. Ell. “A note of caution [about] monoclonal [antibodies] came from Bares et al. [from the University of Aachen in the Federal Republic of Germany] and Muxi et al. from Hospital Clínico Barcelona, in Spain, who stated, in a carefully evaluated study, that monoclonal scintigraphy seems to be of little help in the evaluation of patients with colorectal cancer” (Nos. 78, 145), Dr. Ell reported. He noted that “in contrast, two very positive notes came from Baum et al. from Frankfurt, FRG and Buist et al. from Amsterdam. Baum reported success in the detection of bladder carcinoma and lymph node metastases (No. 108) and Buist et al. reported significant success in the detection of omental and peritoneal [localizations from ovarian carcinoma]” (No. 81).

In a discussion of new radiopharmaceuticals, Dr. Ell said that a “P256 antibody, despite not being available to us in the market, continues to make news.” Describing a study by Perkins et al. from University Hospital in Nottingham, UK, he said that the group demonstrated that P256 “is a most interesting antibody” for imaging peripheral arterial thrombi. The group reported, according to Dr. Ell, that chronic non-active thrombi older than 30 days are generally not observed and that “this may be a valuable prognostic indicator for patients with active
thrombi” (No. 147).

Höfken from the University of Marburg, FRG studied BW4 monoclonal antibodies (No. 148). The group concluded that BW4 is suitable for imaging phlebothrombosis in the early stage. “Technetium-99m labeled MABs are or seem to be suitable for non-invasive thrombus imaging,” noted Dr. Ell.

Signore, Pozzilli, Britton, and their colleagues from the University “La Sapienza” in Rome, Italy and St. Bartholomew’s Hospital in London reported on the use of IL-2 labeled with 123I for the in vivo detection of activated lymphocytes in infiltrated tissues (No. 536), noted Dr. Ell. The group successfully labeled the IL-2, injected it into rabbits, and demonstrated binding in activated lymphocytes of diabetes-prone mice. Confirming the specificity of IL-2 binding by autoradiography, they concluded that “the injected diabetes-prone mice show accumulation of radioactivity in the pancreatic region that correlates with the degree of lymphocytic infiltration histologically detected in the endocrine pancreas and that this technique can be extended in humans for the in vivo detection of lymphocytic infiltration in organ-specific autoimmune disease,” reported Dr. Ell.

A study by Hertel and colleagues from University Medical Center in Frankfurt reports the first use of a 99mTc-labeled monoclonal antibody directed against the T-cell receptor for the immunoscintigraphic diagnosis of transplant rejection (No. 146), according to Dr. Ell. The group concluded that immunoscintigraphy using the 99mTc-labeled anti-T lymphocyte antibody BW III can be used for the rapid and specific non-invasive diagnosis of kidney transplant rejection and that it would be useful to look further at the application of this tracer to the diagnosis of T-cell lymphomas.

Cardiology and Circulation

“Over the last two or three years,” Dr. Ell said, “some voices from far distant corners have been . . . trying to tell us that [to] be useful to clinical cardiologists we [must] address the issue of myocardial viability.” Dr. Ell compared magnetic resonance imaging (MRI) findings with information obtained using radioactive tracers. He noted that Kleinhaus and his colleagues from the Technical University of Aachen measured left ventricular systolic wall thickening with MRI and compared it to regional myocardial perfusion measured by 201TI SPECT (No. 121). The group “proved that this measurement is a good marker for this index. They demonstrated that normal perfused areas have normal systolic wall thickening, that a marked decrease of systolic wall thickening was found in segments with perfusion deficits, and that MRI is a helpful tool in the assessment of myocardial viability in post-infarction diagnosis.”

He also noted that Smolarz and his colleagues from the University of Köln in FRG compared MRI with MIBI SPECT in the evaluation of infarction size (No. 6). The researchers reported that there was good agreement between the MRI functional and morphologic data and the MIBI myocardial perfusion assessment. The group concluded that myocardial imaging by MIBI SPECT appears to provide exact quantification of the extent of myocardial infarction, especially when compared with the morphologic information of MRI.

In what Dr. Ell considered one of the most important contributions to the meeting, Cuocolo and his colleagues from the National Institutes of Health in Bethesda, Maryland compared 15O and [18F] fluorodeoxyglucose (FDG) PET with 201TI SPECT reinjection in the detection of myocardial viability (No. 31). Out of the 432 segments the researchers analyzed, 166 had irreversible 201TI defects on redistribution images before reinjection. In irreversible defects with severely reduced 201TI activity, [18F]FDG uptake was observed in half of the segments; 201TI reinjection showed identical results. They concluded that 201TI reinjection is an accurate method for identifying viable myocardium in patients with coronary artery disease and left ventricular dysfunction.

Lucignani and his colleagues from the University of Milan assessed myocardial perfusion with MIBI SPECT and ammonia (NH3) PET in patients with coronary artery disease (No. 32). The researchers observed a good overall correlation between these MIBI and NH3 images, but there were some differences in the lateral superior and septal segments, possibly due to attenuation in the SPECT study.

Dr. Ell reviewed another study by Knapp et al. from Bad Oeynhausen, FRG, which examined post-infarction myocardial viability and function with 11In antimyosin antibodies and MIBI (No. 3). The investigators combined the antimyosin antibody images and the MIBI images with amplitude and phase to see whether they could distinguish viable from nonviable myocardium. The group concluded that a combination of these two tracers makes possible sufficient differentiation of viable akinetic myocardium and irreversible myocardial damage following acute ischemia. Valette et al. from Orsay and Créteil compared [123I]metaiodobenzylguanidine (MIBG) versus 201TI, processed the images, looked at the differences, and concluded that MIBG can detect viable myocardium better than 201TI (No. 57).

Neurology and Psychiatry

Dr. Ell began his presentation of psychologic and neurologic applications of nuclear medicine with a study by Matsuta et al. from Kanazawa University Hospital in Japan, which analyzed haloperidol effects on regional brain function in hallucinating schizophrenic patients using 99mTc HMPAO SPECT (No. 75). The group performed a rest study and a study after
injection of haloperidol (10 mg), and reported that haloperidol improves frontal hypofunction bilaterally and suppresses temporo-parieto-occipital hyperfunction selectively in the dominant hemisphere in patients with schizophrenia.

Zito and the group from the University of Milan used 18F and confirmed "an established trend," said Dr. Ell (No. 405). "That is, whenever we look at cerebral metabolism or cerebral perfusion with . . . either PET or SPECT tracers, we confirm the differences which can be elicited from detailed psychometric assessment of these patients and that these deficiencies tend to be far more diffuse . . . than the local abnormalities demonstrated by . . . localizing methods, such as MRI." The group's "findings indicate metabolic reduction in multiple sclerosis in cortical and subcortical gray structures and may be related to a differentiation process in the presence of multiple plaques.

"The new trend," Dr. Ell added, "however, is to look at specific tracers which image organ function and measure organ function not detectable by other means." A multicenter European study used [123I]iodobenzamide (IBZM) as a D2 dopamine tracer. With medication IBZM is blocked from going into the area where it usually goes in normals. Five minute data show clear differences between treated and untreated patients as early as 100 minutes after intravenous administration of the tracer. Chalon et al. from INSERM in Tours, France examined D2 dopamine receptors using iodine-125 ([125I]) iodoethylspiperone (No. 68). The group presented "convincing animal data," according to Dr. Ell.

In a presentation on epilepsy studies, Dr. Ell noted that Van Isselt et al. from University Hospital in Utrecht, The Netherlands, examined epileptic foci with [123I]iomazenil SPECT imaging (No. 73). The Dutch researchers compared iomazenil images with results obtained via surface and depth electrodes and via FDG PET cerebral blood flow studies and concluded that [123I] iomazenil SPECT is slightly superior to FDG PET for detecting epileptic foci. Dr. Ell said that "Iomazenil is more economical, more widely available, and a good alternative to FDG and carbon-11 (11C) flumazenil PET in the presurgical evaluation of patients with medically intractable complex partial seizures. Both . . . the PET and the SPECT tracer appear most reliable in patients with unilateral temporal seizure onset. And due to its presently limited spatial resolution and/or the extent of abnormality concerned, iomazenil SPECT should primarily be used for lateralization of the epileptic focus."

Schober and his group from the University of Münster and the Paul Scherrer Institut "concluded . . . that simple technetium HMPAO will do the job at least as well" (No. 72).

Oncology

Duncker et al. from the Hospital de Sant Pau in Barcelona, Spain, in "a most elegant study," compared radiolabeling of bone marrow with 99mTc-labeled NCA (antigranulocyte monoclonal antibodies BW250/183) to bone scans in patients with breast cancer and suspected bone metastases (No. 40), reported Dr. Ell. The bone marrow study sensitivity, 78%, was significantly better than the bone scan sensitivity, 53%. The group concluded that the bone marrow scan with the antigranulocyte antibodies is a sensitive method for the early detection of bone metastases in patients with breast cancer and clinically suspected bone metastases.

Reske et al. from RWTH in Aachen, also compared bone scanning with bone marrow scanning for the detection of metastatic spread to the skeleton, this time in cases of malignant lymphoma, multiple myeloma, or solid malignant tumors. The group concluded, according to Dr. Ell, "that this antibody allows for an excellent visualization of bone marrow, that bone marrow and bone scanning enhanced the detection of disease, and that bone marrow scanning detected skeletal involvement in solid, lymphatic, and myeloid malignancies with increased sensitivity compared to bone scanning or planar radiographs."

Baum and his colleagues from the Goethe University Medical Center in Frankfurt presented a study in which they used 111In anti-CEA monoclonal antibody SPECT imaging to identify lymph node metastases of bladder carcinoma (No. 108). The researchers concluded, according to Dr. Ell, that the antibody binds to muscle-infiltrating bladder carcinoma but not to normal bladder tissue; that for detecting regional lymph node metastases, the sensitivity of monoclonal antibody SPECT imaging (greater than 80%) is much higher than the sensitivity of computed tomography (less than 20%); and that SPECT using 111In-labeled anti-CEA monoclonal antibodies can contribute information that is necessary to decide between chemotherapy and surgery. "Immunoscintigraphy, in this context," noted Dr. Ell, "appears to be of high clinical value in preoperative staging and postoperative care of patients with bladder carcinoma."

Parathyroid Imaging

O'Doherty, Coakley et al. from Kent and Canterbury Hospital in the UK studied the uptake of 99mTc sestamibi and 201Tl in abnormal parathyroid glands and the "recurrent problem of finding the best tracer to detect parathyroid adenomas" (No. 24), reported Dr. Ell. "Sestamibi appears to be doing much better than thallium," he said, for the following reasons. "The thyroid uptake and washout are similar for both tracers, but there is a greater accumulation of sestamibi than thallium in the parathyroid tissue. The [thyroid] uptake of these tracers is similar . . . Dynamic data suggests slower washout for sestamibi than for thalli-
um. These differences coupled with the different physical properties made sestamibi the better tracer.

Carroll et al. from St. Bartholomew's Hospital concluded that “the advent of MIBI in conjunction with comprehensive imaging, acquisition, and analysis protocol has resulted in greatly improved image quality and detectability in the field of parathyroid imaging” (No. 23).

Mojiminiyi et al. from Oxford University in London examined the clinical application of 99mTc DMSA scintigraphy in patients with medullary carcinoma of the thyroid (MCT) (No. 61). “Whilst in these techniques the series are always small,” reported Dr. Ell, “...they nevertheless demonstrated that the technique has practical value. It is sensitive in the evaluation of patients with MCT, even those with small volume disease. ... Scintigraphic results led to neck re-exploration in a number of patient neck biopsies, early surgical resection, and early radiotherapy. In small series of patients, we are giving information which the clinician is taking into account.”

Sandrock and colleagues at the University of Göttingen, in FRG compared three methods — 201Tl, 111In monoclonal antibody fragments, and [131I]MIBG — for the detection of local recurrences and metastases of MCT (No. 62). They concluded that immunoscintigraphy with 111In/99mTc anti-CEA fragment antibody is superior to scintigraphy with 201Tl and [131I]MIBG. Dr. Ell commented, “For oncologists and radiotherapists this conference carries an important message of clinical significance. ... That is... bone marrow imaging [to] screen the whole body... and MRI... to hone in [on] specific areas of difficulties. [This is] a beautiful strategy [with] practical applications.”

Gastroenterology

Dr. Ell presented several studies on gastrointestinal tract imaging, starting with a study done by Caner et al. from Hacettepe University in Ankara, Turkey in which the group clinically evaluated polystyrene/polycrlylate latex particles for imaging colon transit and morphology (No. 186). The researchers concluded that 99mTc latex particles could be traced through the gastrointestinal (GI) tract, even shortly after surgery, without interference from background or other organs, thereby providing functional information. “For the first time,” noted Dr. Ell, “we can look at the morphology of the GI track, display it in detail, and provide accurate calculation of gastric emptying, small bowel transit, and 50% filling time of colon.”

Spinelli and his colleagues from Ospedale Niguarda-Ca’ Granda in Milan assessed the value of 99mTc-labeled human immunoglobulin (HIG) scanning in patients with Crohn’s disease (No. 181). “With this data,” Dr. Ell said, “[the group] quite rightly concluded that HIG is inferior to HMPAO [labeled leukocytes] and not suitable as an alternative test to the radiologic and endoscopic study in evaluating the extent and the activity of Crohn’s disease.”

Buscombe led a study at University College and Middlesex Schools of Medicine that compared 99mTc HIG with 111In oxine leukocytes (No. 160). Buscombe et al. concluded that the results demonstrated the efficacy of 99mTc HIG and that the high degree of concordance with 111In oxine leukocyte imaging suggests that HIG may enable clinicians in centers without cell labeling facilities to perform infection studies. Dr. Ell noted that the “advantages of this tracer would be the ease of preparation, the good imaging properties, the absence of cell labeling, the good level of concordance with 111In [white blood cells] WBCs, and the utility in a wide range of clinical problems. The disadvantages of the tracer would be its high blood pool activity, the renal uptake and clearance, and the lower uptake, lower target-to-background ratio, than that obtained with 111In WBCs.”

Kroiss et al. from the Ludwig Boltzmann Institute for Clinical Geriatrics, KA Rudolstiftung, in Vienna, Austria, tested the clinical efficacy of immunoscintigraphy with 99mTc-labeled granulocyte antibodies in patients with Crohn’s disease and ulcerative colitis (No. 171). According to Dr. Ell, the group produced images that were “clear cut... easy to interpret, [and made it] easy to pass the information to the clinician.” The researchers concluded that this immunoscintigraphic technique can help clinicians localize and determine the extent of active or inactive bowel diseases. The technique is easy to perform because no in vitro cell separation is needed.

Infection and Inflammation

In his summary, Dr. Ell pointed to “an ever growing number of tracers,” to detect infection and inflammation. “We cannot use all of them, we must make choices based on comparative studies.” He described a study by Oyen, Corstens, and their colleagues from University Hospital Nijmegen, The Netherlands, which compared scintigraphy using autologous 111In-labeled leukocytes with 111In-labeled IgG in patients with low white cell counts (No. 182). In this select group of patients, 111In-labeled IgG is more accurate than 111In-labeled leukocytes.

Calame et al. from the University Hospital, Leiden, The Netherlands, used 99mTc polyvalent HIG in a series of experiments to localize Staphylococcus aureus infection in the thighs of mice (No. 9). Dr. Ell reported that the group indicated “that leukocytepenia does not affect the target-to-background activity of HIG, that there exists a log-linear relationship between the number of bacteria injected [and] the target-to-background activity at the site of infection, that the increase in the number of bacteria was reduced when one used antibiotics,” and that vascular permeability or Fc binding alone could not account for the mode
of action of HIG.

In other studies with this tracer, Becker et al. from the University of Erlangen-Nürnberg, FRG, showed that in humans a specific monocyte-associated uptake and binding mechanism of $^{99m}$Tc HIG plays an important role in localization of inflammatory sites (No. 143). Dr. Ell noted that "the HIG monocyte association can competitively be altered by unlabeled HIG and that the imaging of inflammatory sites as a monocyte component is, presumably, due to an Fc receptor binding. There is controversy in this area," he cautioned.

**Pulmonary Disease**

"The most interesting applications of our studies in patients with lung disease are those which address the most important clinical issue of how to deliver drugs to patients with lung disease," said Dr. Ell. "Whilst this is a new variation of an old theme, it is nevertheless highly important. Ultrasonic nebulizers with high potency quartz can achieve high alveolar deposition notably of pentamidine... but are associated with more frequent side effects."

Thomas, O’Doherty, Page, and colleagues from St. Thomas Hospital in London used $^{99m}$Tc HSA to examine the ability of seven nebulizers to deposit aerosolized pentamidine in the lungs of AIDS patients (No. 149). Dr. Ell reported that "all systems deliver only a small proportion of their nebulizer dose to the lungs, the drug delivery is dependent on the apparatus. The best one... could only deliver... 6 mg of the active drug [out of 300 mg administered to the lungs]."

Rossleigh and colleagues from the Prince of Wales Children’s Hospital in Sydney, Australia performed a prospective evaluation of acute urinary tract infection (UTI) in children using $^{99m}$Tc DMSA scintigraphy (No. 95). Dr. Ell noted that the group "demonstrated... the vanishing wedge-shaped defect, which, if we are not careful, we label as scar... and which resolves with time. The incidence of DMSA abnormalities at the time of acute UTI is high. There is a tendency [for] acute DMSA abnormalities to resolve with time. Scans performed in the first few months after UTI must be interpreted with caution, as the abnormalities may be transient. And that implies that we must know when the UTI has occurred."

**Bone Mineral Analysis**

During his summary, Dr. Ell recommended that "both Associations and these Congresses should place a greater emphasis on what has been described as the most frequent of all diseases, namely, osteoporosis." He cited two recent editorials in the literature. "One, from The New England Journal of Medicine, May 3, [1990] by Storm et al. —Effect of Intermittent Cyclical Etidronate Therapy on Bone Mass and Fracture Rates in Women with Post-Menopausal Osteoporosis. ‘... at the end of nearly three years, etidronate therapy for post-menopausal osteoporosis results in significant increases in... bone mineral content and, after one year, in a significant decrease in the rate of new fractures.’ Two days later, the editorial in the Lancet reviewed the modalities of treatment... and concluded that... sodium fluoride increases bone [mineral content], but the bone is brittle, and new fractures increase; biphosphonates actually increase bone mineral content and reduce new fractures. And on top of that we have... other modalities, such as calcitonin for patient treatment."

**Therapy**

Referring to the myriad possible applications of nuclear techniques to the treatment of disease, Dr. Ell said, "The treatment of conditions, even of patients who are terminally ill, just for the purpose of alleviating pain, is now within our possibilities. And every patient, and every doctor will be grateful to us if we give them that opportunity." Using strontium-89 [$^{89}$Sr], "effective relief is feasible in 75% of patients and complete pain relief in 20% of patients." Other tracers, such as rhenium-186 (186Re) are being evaluated, and "similar data is beginning to appear."

Victor et al. from CHU Rangueil in Toulouse, France reported the results of a French multicenter phase II trial on the treatment of hepatocellular carcinoma by transarterial injection of $^{111}$I iodinated oil (No. 193). Dr. Ell reported that the group concluded that "there is excellent clinical tolerance, evident efficacy on pain [relief], objective signs of tumor response in 60% of cases, and a probable efficacy in terms of survival."

Dr. Ell reported that Blower, Singh, et al. from Kent and Canterbury Hospital prepared and characterized pentavalent $^{186}$Re DMSA (No. 195) as a radiotherapy agent for MCT and other tumors. "If they will succeed [in getting] [in getting] rid of the excessive renal uptake of the tracer... we [will] have another therapeutic agent at hand," predicted Dr. Ell.

Zeicher et al. from the Institut Bordet in Brussels and Medgenix, SA in Fleurus, Belgium used chloromethyl iodovinyl estradiol for targeted radiotherapy of estrogen receptor positive tumors (No. 194). The group reported that the data suggest that the estradiol receptor could be a suitable site for targeted radiotherapy.

In conclusion, Dr. Ell remarked, "I have reviewed... some important clinical issues—myocardial viability, early detection of malignancy, treatment monitoring of HIV infection, and detection of inflammation and infection. We have, however, to [widen] our vistas to other fields." He suggested that there was a role for nuclear medicine in evaluating the relationship between radiation exposure and disease. The significance of radon exposure, in particular, offers an important challenge.