TSEM Texas Society for Electron Microscopy NEWSLETTER

Fall 1976

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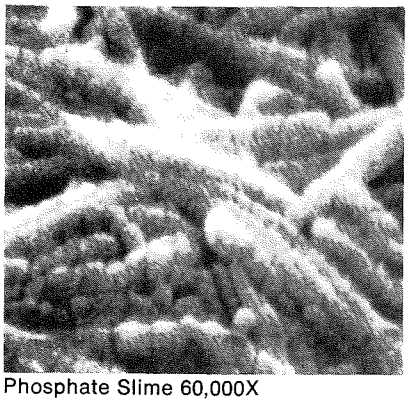

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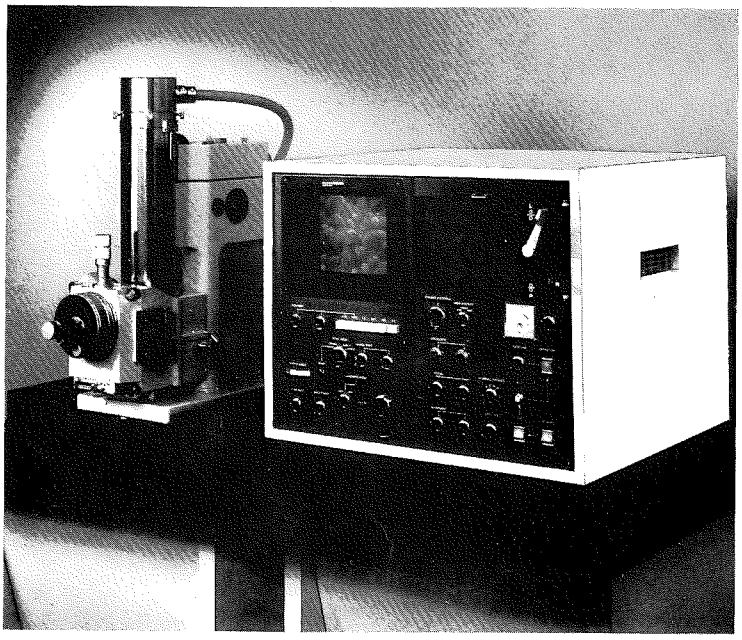

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Volume 8, Number 1 **Fall 1976**

Texas Society for Electron Microscopy

"For the purpose of dissemination of research with the electron microscope"

ON THE COVER

A cat flea is pictured on the front cover at 260X, made from a negative (SEM) furnished by Dr. William N. Norton of the Baylor College of Medicine, Houston.

President's Message

I would like to take this opportunity to welcome the new members to the Society and I want to thank those members that gave me the responsibility for continuing the success of TSEM. I am looking forward with enthusiasm to our three yearly meetings: Temple, Texas, New Orleans, Louisiana in conjunction with LSEM and SEEM (Southeast Society for Electron Microscopy), and Austin, Texas, at the University of Texas. Your cooperation in supplying ideas and energy into these meetings will benefit all of us.

During my administration I personally would like to see our Society provide more educational "benefits" to our student and regular members as this Society is an educational organization founded for the purpose of disseminating information.

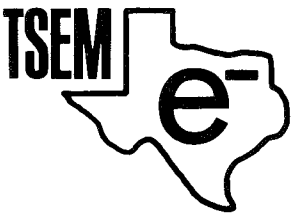
Our financial status is healthy, thanks to the intelligent efforts of past administrations. Assuming such leadership continues, I believe we can maintain a substantial financial deposit to protect against unforeseen problems while returning monies to the membership in the form of educational benefits (scholarships, travel grants, mini-grants, etc.)

The Newsletter editorship is in the hands of Bob Turner at Scott & White Hospital, Temple, Texas, and it will remain the primary vehicle of communication for the membership. Currently it is self-supporting financially and I hope that we will be able to continue with three publications yearly. Your full support is needed to maintain the newsletter as the best local Society publication of the nation. Our membership continues to increase and currently counts around 450 members. All interested individuals should be encouraged to join TSEM as it is a bargain in times of inflation. I hope we can incorporate a greater number of individuals with interest in the materials and physical sciences. The spring meeting at the University of Texas will emphasize this particular area, while maintaining our traditional trend in biomedical sciences. Several symposia will be organized around "state of the art microscopy and microprobe analysis."

The EMSA annual meeting is scheduled to be held in San Antonio in 1979. Our Society will serve as the host and I am confident we can provide a good organizational and scientific environment for the national convention.

I am looking forward to the Temple meeting and I hope most of you will attend for the sake of science and friendship. In advance I want to extend my thanks to an excellent Executive Council. Let's make this a prosperous year for scientific growth and Society expansion. I hope everyone has a healthy and productive year.

E. LAURENCE THURSTON
President



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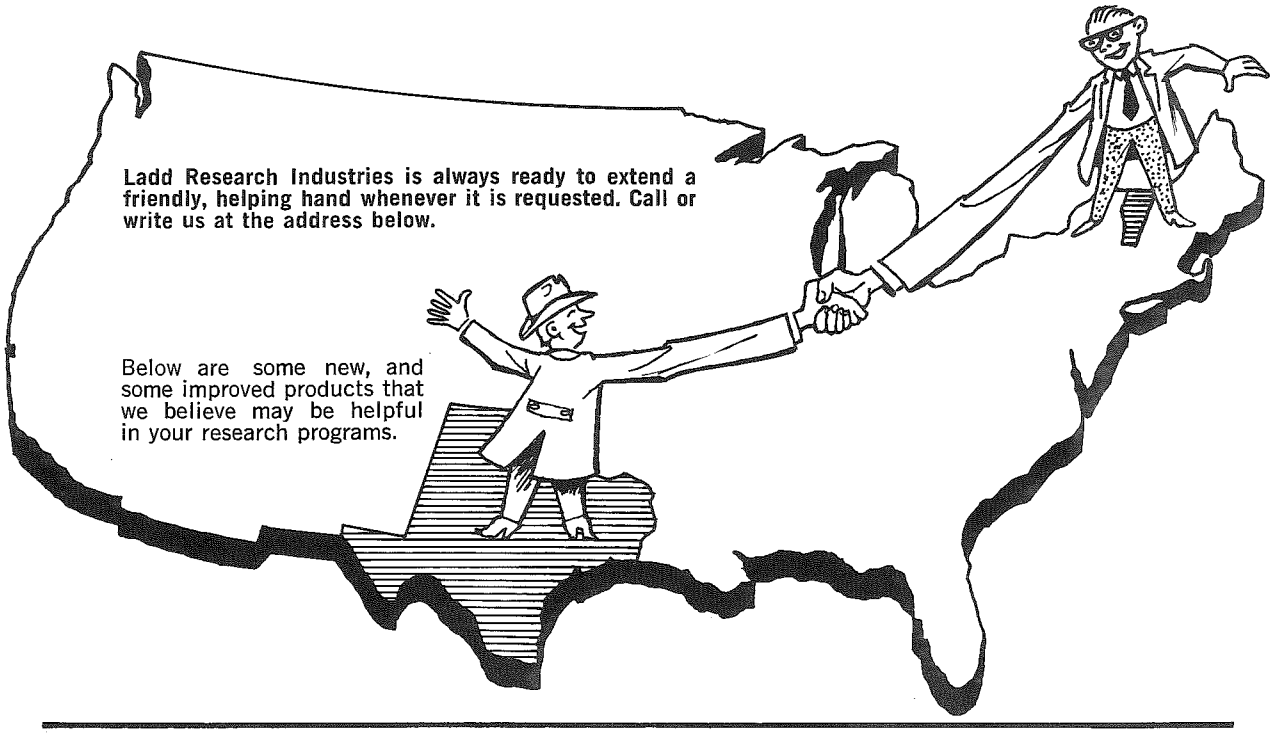

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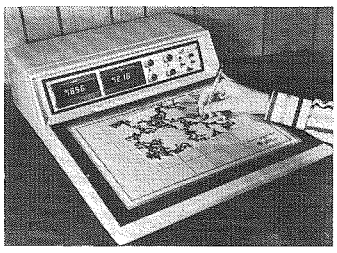

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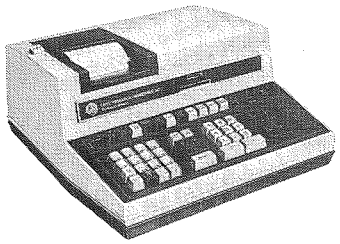

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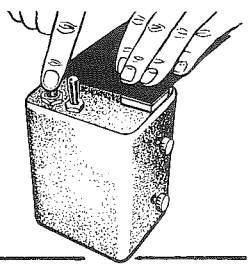
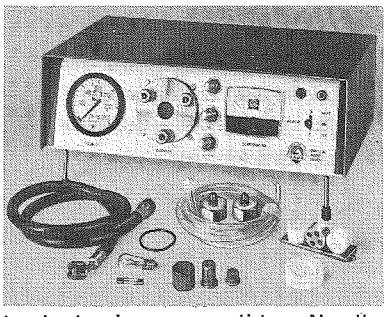


CRITICAL POINT DRYER



A new significant new entry in the field of critical point instrumentation. For use with Freon, carbon dioxide or other transitional fluid. Incorporates many new developments and improvements. Specially designed chamber permits true bottom draining or independent upper venting, and accepts a range of material from the smallest samples up to and including six standard microscope slides. Needle valves permit fine control of fluid entering or leaving chamber. Maximum temperature and pressure automatically controlled by internal electronics system.

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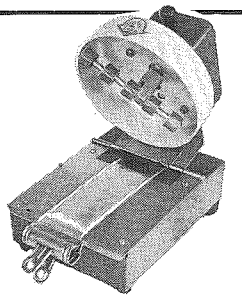

This new device for thoroughly mixing resin solutions also eliminates air bubbles from the mix. The resultant blocks have much improved cutting qualities. Components are placed in a sealed airtight envelope and thoroughly manipulated by an electrically powered roller assembly. Rugged and compact. 6″ x 9½″ x 8½″ high.

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Editor's Comments

As most of you know by now I have assumed the enormous task of becoming the new editor of the TSEM newsletter.

I took the job mainly to make sure the Newsletter continued in its true fashion of being a great means of intrasociety communication. Also, because I have seen it grow from its original concept of a single mimeographed page of news to what it has become today.

I will readily admit that I am no "editor" but in accepting this new position, I have learned new terminology, a new way of coordinating people and especially a new brand of headaches. It is my goal as your new editor to continue a first class Society Newsletter that currently has a distribution of approximately 700 readers.

It cannot be overlooked that the main financial backbone of our successful Newsletter is our corporate members.

The continued support of our corporate members is quite evident by their purchased ads in this issue of the Newsletter. Again, I want to thank each company who purchased advertisement in this issue and will certainly appreciate their support in future issues.

I would appreciate receiving some of the following from TSEM members for future issues:

- Interesting cover page pictures, either TEM or SEM.
- Scientific articles, either biological and physical.
- Technique notes.
- Advertisement from corporate members, cost is $50 per full page.
- Local area news.
- Editorials.
- Job openings or people seeking employment.

I would appreciate any contribution and cooperation you can give me for future TSEM Newsletter issues. Send all news, articles, briefs, notes, editorials and advertisements to:

Robert A. Turner
TSEM Newsletter, Editor
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Scott and White Clinic
Temple, Texas 76501

Letters

As a sometime member of TSEM, it is a pleasure to see a longtime member back working as Editor of the Newsletter. I know yours in a thankless task, and one for which you are always assured of receiving the blame when things do not go right and absolutely no credit when they do. Any comments I make, therefore, in the next few paragraphs will not be directed at you necessarily, unless you can to so interpret them.

Having been in administration for some years now, especially during the last five or six, in an area where professionals have been hired on a rather frequent basis, and also having had access to budget information, I have been increasingly impressed with the disparity between various salaries, whether these be in the area of classified personnel or professional, such as faculty. All of us are usually concerned about our earnings, the source of our income, and what future will bring as far as promises and threats; however, one basic fact remains — our progress financially, and our position in most instances, begins with a "starting salary". It is from this base, then, providing one adopts the natural loyalty that is expected and stays with the particular institution, that our future income will be predicated.

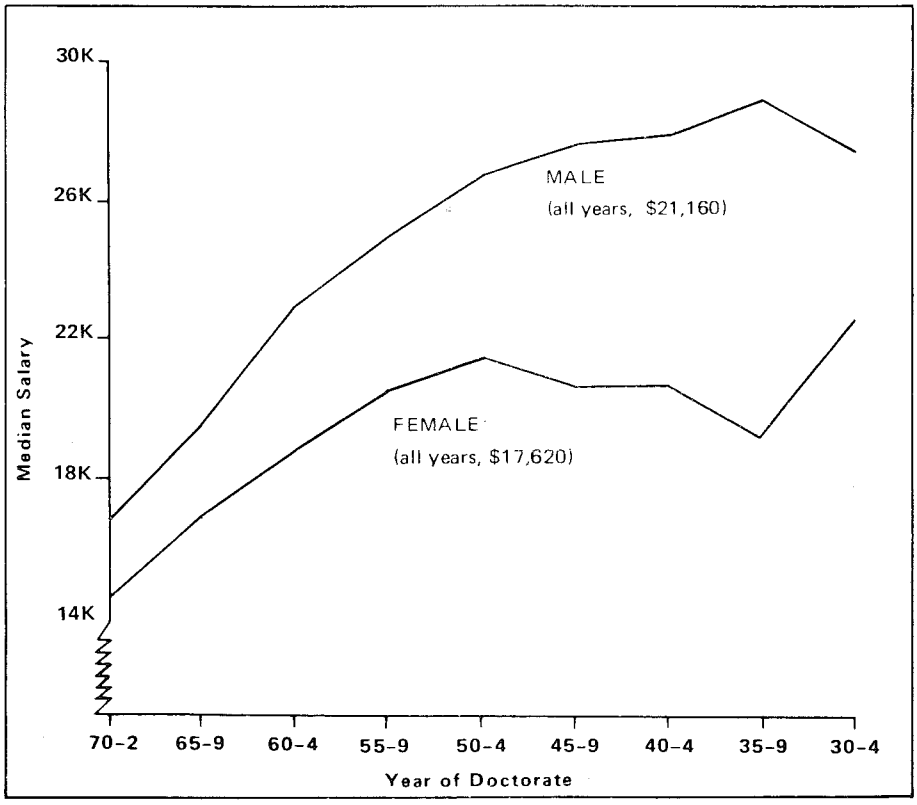
There is no doubt that remunerations should vary. This variability can depend upon educational background, training, experience, and the oftentimes difficult to evaluate attributes of professional administrators such as talent, ability and expertise. As one progresses through the natural steps of a particular position, and improves in competence, while living costs continue to soar hopelessly as time passes, each one of us, in our own way, receives some increase in our remuneration. I still point out, however, that it is all relative to "what our starting salary was." Not only is it related to what that starting salary was, but increases are usually on a percentage basis and thus even more tied to "starting salary". One of the greatest disappointments that I have seen over the past few years, and this is reflected in the poster at the recent EMSA meeting in the Placement Office, is the discouraging difference between salaries for women and salaries for men. This is also reported in a recent Wall Street Journal article, *Woman Lagging, J. Kronholz* in *Wall Street Journal*, 6 July 1976, p. 1,31 (pd 3136a) "Though women accounted for the entire 1.7 million worker increase in the US labor force since 1974, a recent US Department of Labor report notes that the twin problems of working women — underpay and underemployment — are as severe as they've ever been . . . The

fact remains: The average female college graduate earned less last year than the average high-school dropout." This totally inconceivable disparity prompts me to send you this letter. I have sent for a copy of the EMSA information and once that arrives I would like to have it published in a subsequent Newsletter. Meanwhile, one can refer to *B. M. Vetter, Women, Men, and the Doctorate, Science,* December 1974.

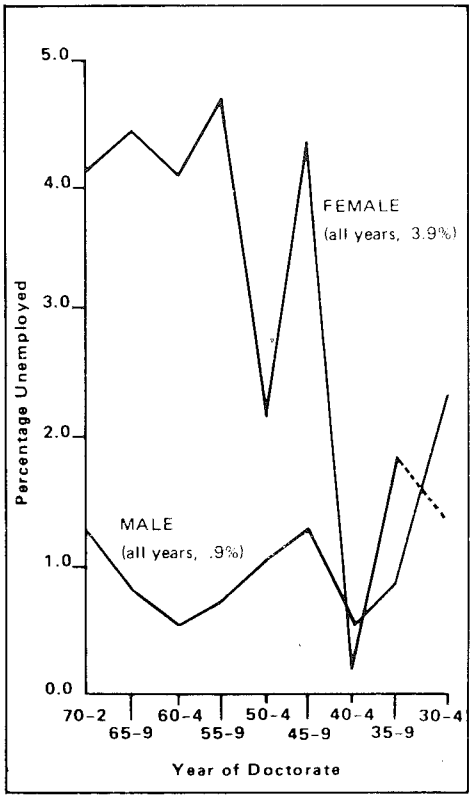
I think now, though, it is time to call attention to such events. It seems that, although we are now supposed to be in a revolutionary era where "women are new on the professional job market" this is not true at all, because you, I, and people older than us can remember a considerable number of women in our past educational experience who were at similar market levels. They may not have been very conspicuous because they were not assigned the prominent positions, or promoted, or put forward within the various departments. They were staff members; they did some of the work and a lot of the scut work, and they were pretty well kept in their place. Therefore, if they did not (they could not) perform as a level commensurate with their "male counterparts", they did not justify an equivalent salary. It seems to be a very unique subconscious device that is used by a number of male administrators, and is recognized as such, so much so that to those of us who are quite sensitized to it, we can see excellent female faculty members, who now have been so conditioned that they refuse to participate at scut work levels where this work is often critical. We are now encountering a form of backlash. I digressed a moment. It still is apparent that there were women in professional levels in the past; the numbers in the various classes in schools and institutions may have increased somewhat, but so have the numbers of everyone else. Salary scales for women have also increased markedly over the past few years, and this is highly commendable. I would also point out, however, that so have salaries for men increased markedly over the past few years. If one really examines the data, one will find that women are still underpaid at the same relative level as they were 10 to 15 years ago.

The situation is similar on the technical side. Female electron microscope technicians are usually paid less than male electron microscope technicians. This is because the female "cannot do the heavy work" associated with electron microscopy. Will any of you please tell me how much heavy work is still done in electron microscopy? How many of us have to disassemble a column now, or remove a pole piece, or lift vacuum pumps out so that the oil can be changed. I fail to see why muscle power has to be a requisite for an EM technician. Such a rationalization leaves one to wonder

Median Annual Salaries of Doctoral Students and Engineers by Sex and Year of Doctorate



Unemployment Rates of Doctoral Scientists and Engineers by Sex and Year of Doctorate



NOTE: Interrupted lines indicate that data points are based on fewer than 100 sample cases.

Figure A

From National Research Council Commission on Human Resources December, 1974

whether or not the individuals who are doing the hiring for electron microscopy know what the laboratory is all about in the first place, or if they are really abreast of current instrumentation. I think institutions, as well as individual employers, should reevaluate job descriptions based on modern day laboratory instrumentation, educational background, talent and ability, and expertise.

As pertains to the people at the doctorate level, the salary scales reflected as EMSA show that the discrepancy in salaries at their level is exceeding broad. I am having a difficult time understanding, again, why such discrepancies exist. That they do exist is evident; that they should exist can be justified in the minds of many individuals. Such differences in salaries, therefore, reflect primarily attitudinal considerations on the part of individuals in the upper levels of the pyramidal power structure. Various comments from males in upper supervisory levels to justify such salaries are:

1.) "She just doesn't have it" —I am not sure what "it" is and I am not sure what that gentlemen means, or who has established what "it" is. How do we evaluate "it"?

2.) Another comment is "she is not aggresive enough" —however, experience has shown that if a woman is aggresive, she does not stand a chance of being hired; therefore, another dilemma.

3.) Another comment is "she will never make it full-time; she will get married, have a family and be absent from work". I would like to ask how many males, especially those who are good husbands and fathers are absent from day to day work activities for household chores; this may be anything from replacing a hot-water heater or mending garage doors to being at the bedside of a sick child or a sick wife. This is as it should be, and it should be true for both sexes.

4.) If a female faculty member comes charging into an office irritated about finances or about conditions in a department, or a program, or about the way a particular situation is being handled, then it is passed off and joked as either raging hormones and/or "that time of the month". If her male counterpart charges into an office, rants and raves, makes relatively nondiplomatic comments, then that is "his personality and his way of responding". One is classified as a characteristic of females and is a generalized, derogatory explanation; the other is referred to on an individual basis and no reflection is cast on males at all.

I was recently warned about a particular female that "you had better watch out for her; she will try to take over your department". This was intended as well-given advice by the giver, who considered himself all-wise; what he did not know at the time was, that I have four males and two other females in the department who are trying to take over right now. There are the kind of people I prefer to hire. They have high aspirations and high accomplishment levels.

The preceding anecdotes indicate that there are almost as many excuses as there are people for not giving a female an even chance or for paying her a decent salary. Thus, very talented individuals continue to be penalized. One of the outstanding penalties is that in this very materialistic society, we are judged not only on our merits as workers, scientists, and individuals, but one of the prime considerations of our worth and our position is our salary, or our income. If a group of people is forced into categorically lower wages, then the materialistic side of their record of achievement is not at the level of other colleague groups. What we have done is build a "Catch-22" system: We have hired individuals at low salaries, (we have managed to justify this) since our mechanisms, standards, ideas, and concepts were generated by a group of males attempting to protect themselves. Thus, we have hired, in most cases, people who are either equal or superior, and we have put them and ourselves in a position in which they cannot be superior or even equal. Worse still, we are suppressing the growth and development of capable individuals and putting them into situations where reward is not offered, where attainment and achievement bear a tainted banner and where status recognition and the feeling of self worth, which is of utmost importance, are closeted.

This letter, Bob, was to discuss the differences in financial remuneration of males and females in electron microscopy. I think the question is larger than that, but I firmly believe that the basis for these disparities is attitudinal; these attitudes still persist. We should all be aware that none of us can achieve success by repressing someone else. This is especially true if an individual to be repressed is stronger and/or smarter than we are, because then we must spend all our efforts counteracting their excellence. Why not work with them at the proper level? There are two ways that people cannot look one another in the eye, one is with a nose in the air, and the other is by keeping someone beneath you. If we operate at eye level and side by side with unity of effort and purpose, then the chances of success are far greater almost on an exponential basis as compared to individualized activity.

There are probably some people who say that the TSEM newsletter is not the place for such a letter as this, and you might be one of them. I do hope you will print it because, though it is already too late, all of us must re-evaluate ourselves as we so graciously appear in public, opening doors for very healthy and able young ladies who could open doors for themselves. At the same time, in private, we attempt to close the doors to success for those same individuals. Such ambivalence must be more damaging in this case of the male than to the female. Indeed, it is a psychologically destructive characteristic.

Bob, please understand, this letter is not a criticism of TSEM. I have no data or information about salary discrepancies within this area, although I do know that in some cases they exist. I think that it is important to be aware of national trends (See Figure A) and tendencies and especially of the very discouraging fact that the national trend to correct this salary discrepancy is non-existant is scientific areas. The only hope is that each one of us will look into our own areas, make every attempt to establish equality within our own employment circles, and try to apprise and make future generations aware of the fact that colleague interaction, friendship, and

personal communications are, indeed, rare experiences that add enormously to the enrichment of life, especially when that life is on a daily, working basis in the laboratory, classroom, or hospital.

Inequality or unfair treatment, whether by spoken or written word or activities, oftentimes inflicts injury and may possibly leave scars, depending upon the individuals involved. However, damage to someone's career is far more critical and eventually results in a scar not only to that career, but to the life of that particular individual and everyone around that person. Therefore, categoric, value judgements can oftentimes inflict hardship and have repercussions on the lives of numerous individuals and events. My question is — Do we really know what we are about? We continually accept and live by procedures and standards set for us in the past. Indeed, these may have been *procedures,* but they may not have been *standards* at all. Hopefully, all of us will work toward better *quality* in electron microscopy, better *utilization* of instruments, and better *equality* of colleague collaboration.

DR. JOE G. WOOD
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Houston, Texas 77025

Editorials

Reflections On A Grey Day

The sky is overcast this morning. It's trying to rain — again. It was a restless night for some reason, and now — well, it seems to be just one of those days. You know — the kids already fighting at breakfast, the wife tells you to stop here and there on your way home tonight. Mild protest — "because I was going to the health club." "Well, I'm sorry, you can do that some other time" Another protest, then more words; the kids are still fighting; pretty soon your pancake begins to feel like cement. You start wishing you were as old as you feel, retired, with someone feeding you.

OK — no kiss goodbye this morning. The dog comes in and hides before you go out the door. You think — well, par for the course — even she could care less. "See you tonight, boys". Never mind, now they're arguing over toothpaste. Your outside, then you see it — the garbage can dumped over — what a mess! No wonder the dog went into hiding. No time to pick it up. Maybe the neighbors will complain enough that the kids will *have* to unplug their eyes from the TV and go out and clean it up.

Even the car rejects you — can't seem to keep the damn thing going. You glance at the gas needle. OK — into the other car. What the Hell is that smell?! You reach under the seat — OH GOD! Pieces of moldy Jack-In-The-Box hamburgers! The hell with it — out the window. Let all 14 dogs on our 10 house street fight over it. Maybe they'll all kill each other in the process.

You finally drag into the parking lot after chewing on diesel exhaust for about 20 minutes. Hmmph, Mr. Hobbs never had it so good. He wasn't in a mustang! You walk down the hallowed halls past a large poster. You notice an additional obscene graffiti, added from yesterday. This one is just not bad, its vile. Your up to the lab, but the door is locked. Technicians *sick again*? No message from the Secretary. OK, they're sleeping in, eh? You see a colleague. He asks if you've seen the new graduate students. WHAT new graduate students? I haven't even been given applications to look over for months. Your friends says that all the rest of the department has.

You slump further down in the chair — you know, the one that periodically catapults backwards when the springs snap. A student comes by and asks how much of yesterday's lecture do they have to know for the exam? Your grip on the chair tightens and you remind yourself the death penalty for murder has been reinstituted. You tell the student that is an impossible question and deserves an impossible answer: nothing and everything. The student mutters something about a petition and leaves.

The creeping paranoia is now at a fast jog and picking up speed. Fidgeting — then sighing, heavily. A reflection — I'm supposed to write this editorial. So, what this time? Abuses of power? Why administrators are corrupt? The march of automatistic students towards the precipice of education? How basic scientists cheat the public by quickly spending grant money for useless items before it could be returned to NIH? How scientists rewrite the same data with different wording and get it published in different journals?

No, today I'm almost defeated. I mean, really down. In my numbness I glance at my desk top. There are three pictures there. I begin to study them. One is of my kids. A tremendous picture. I can hear a thousand questions — Why this? Why that? They want to know things and they come to me. I can hear their giggles when I ask them if they are deliberately trying to drive me crazy. They are bright, happy — gifts from God.

I see another picture of the basketball team of 10 and under boys I coached last winter. We missed the league championship but made it to the district playoffs. Nine boys, black and white, from five different schools, and would you believe not once, not one time, in practice or in games, not one dirty word, not one cuss word? It's true! I told them not to use them. I told them to help each

other. They listened. They learned. First playoff game — we started slow; a few things hurt; gradually the outcome was coming into view. It was over before it was half over. But they didn't quit. They tried to do their job. There was no bitterness — no complaints. We went to Consolation — one more chance, the next day. They were eager, past defeats forgotten. This was a new game. We went out to fight. We got a big jump, on top by 14 points. Then, slowly, fatigue. Hang on — hang on. The other team came on. It was asking too much, I thought. My kids were quiet, workmanlike, trying desperately to breathe, to listen to what I was saying. With one minute to go the other team goes ahead by one point. Then they get the ball. One of my boys on the bench starts to cry. I say — hang on. Seven seconds to go, a steal, a foul, we get two shots. But the boy hasn't made a free throw all season. He cans one. Its overtime.

We score in overtime on a play drilled all season from the first practice. Everyone was in the right place and moving the right way. We hold on and win. They had learned and they had taught each other. No petitions, no complaints and no excuses; there was a job to do and they did it.

The third picture on my desk is that of a dear friend, departed from the earthly life, Harry Chandler Elliott, neuroanatomist, author of a text in his field, a man who left an indelible impression on my life, my thoughts, my spirit. He had anterior poliomyelitis as a three year old and it left him a cripple. He wore 40 pounds of metal braces, but drove a car, swam regularly, wrote textbooks, researched the nervous system, was an award-winning novelist, a science fiction writer, a culinary artist in Chinese cooking, a consummate reader and spoke 5 languages. He was affable, a Chesterfieldian-type Irishman, with an indomitable spirit, and he was fiercely independent — known to attack with his cane if one spontaneously attempted to help him upon his falling, which not infrequently occurred. I never saw him in a moment of defeat, although I know he experienced abuse at times. But he rose above this. He was too imaginative and energetic to be dragged down by pettiness.

I glance back and forth at these three pictures. I think how blessed am I to have my life touched by these human spirits.

Ah! the technicians arrive; they have been working downstairs. Another colleague comes in to tell me a student made the remark to him that he really appreciated my lectures: "Dr. Kischer really makes you think". My wife calls, "Honey, I'm sorry about this morning; we'll have your favorite tonight — when you get home from the Y."

I hang up the phone. I glance at Chan Elliott's picture. He's looking at me — I'm looking at him. For a fleeting instant I could swear he just winked at me, and he is telling me from his Irish heaven, as he did once before, to "cover yer sorrows with the skin of a gooseberry"

It's noon and I walk outside. The sky is clear now; a bowtail grackle is sitting high on a tall fan palm tree. It shrills loudly, then, suddenly, it jumps off — dancing in flight a bit, then large movements of its wings, up — up, now — soaring. It is free — and, so am I.

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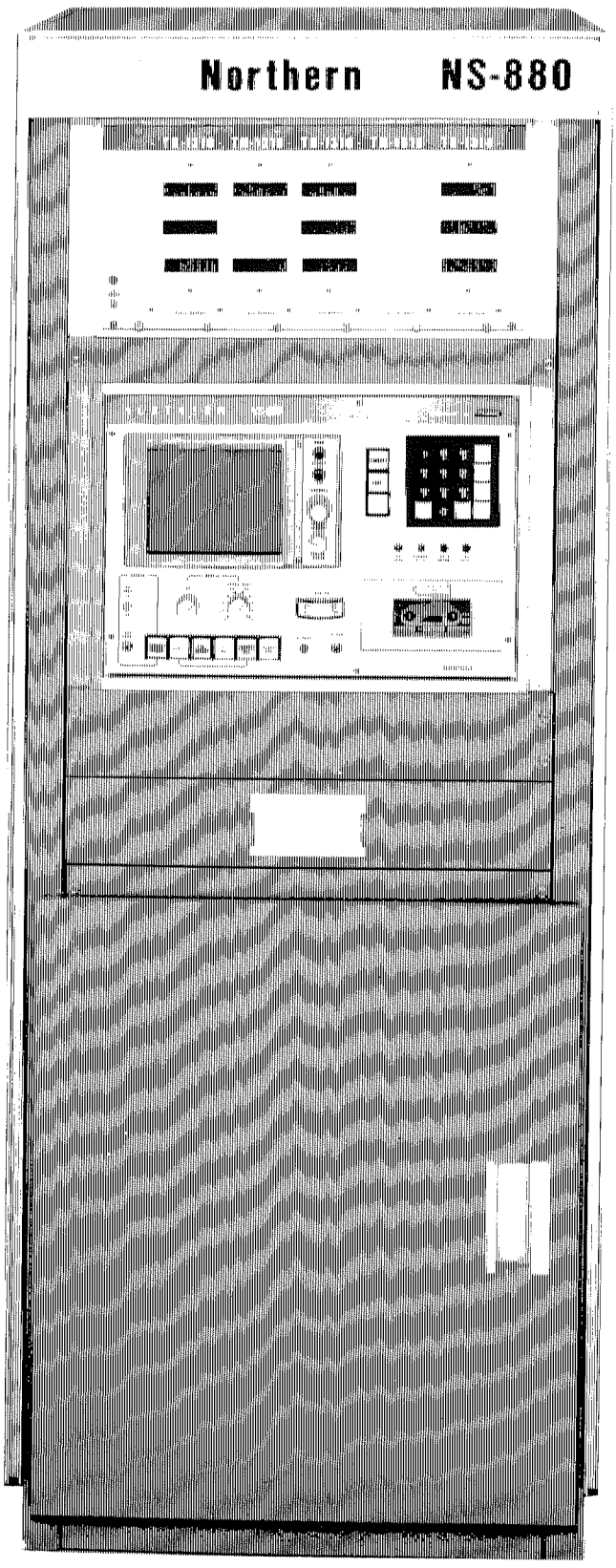

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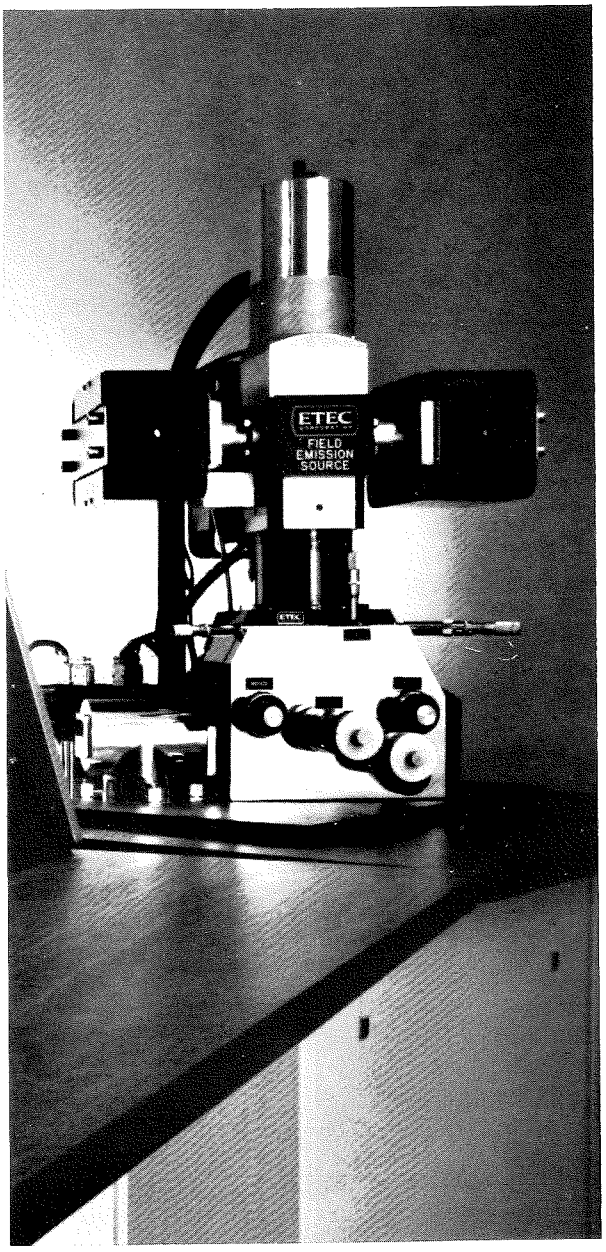

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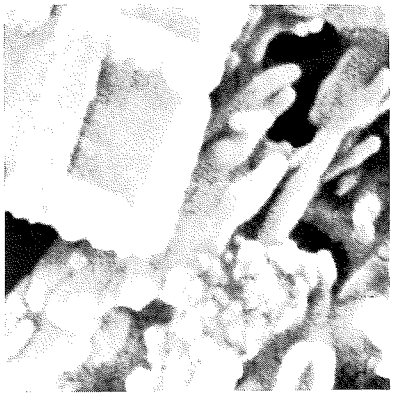

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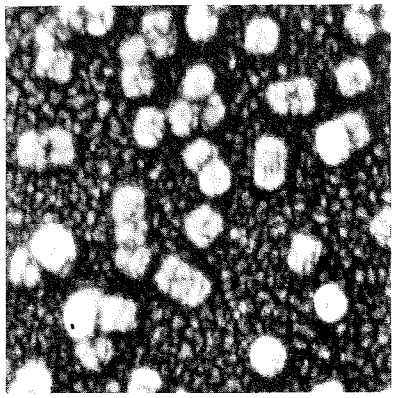

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FEATURE

Cytoplasmic Granules In Tumor Cells

An Assessment of Their Role in Differential Diagnosis

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Secreting cells commonly package their secretory product in small spherical aggregates limited by a unit membrane, and these granules accumulate to varying degrees within the cytoplasm. Similar granules are found within many neoplastic cells, and in the better differentiated tumors they resemble those of the normal cell. Consequently they may be of considerable assistance to the pathologist when identification of the tumor is a problem by light microscopy.

Secretory granules are formed by the golgi complex in exocrine and endocrine cells, protein from the ribosomes being wrapped within the golgi cisternae where carbohydrate moieties may also be incorporated. Small granules can fuse to form larger aggregates, but in general the range of diameters is relatively narrow for a particular cell type. Granules of similar caliber may occur in more than one cell type, however, and morphologically unique granules are found only occasionally. The pathologist must also bear in mind the fact that alterations in granule number, size and even shape may result from dedifferentiation.

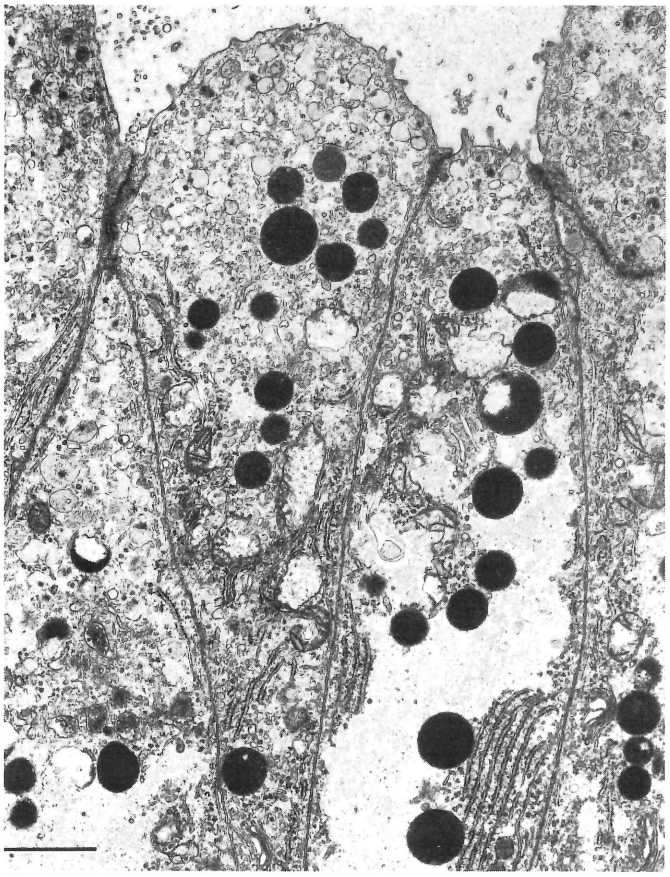

FIGURE 2 — A profusion of large granules in cells of an acinar cell carcinoma of the parotid gland.

Our object is to review the spectrum of tumors of man in which cytoplasmic granules are a characteristic feature. Some of these neoplasms are usually identified without difficulty by light microscopy, while others have a propensity to pose diagnostic problems, particularly when poorly differentiated or encountered in metastatic locations. The illustrated cases were selected to demonstrate the range of granule morphology that may be seen in the cells of human neoplasms.

Large secretory granules measuring as much as 1 micrometer in diameter are found in certain exocrine cells, notably acinar cells of the pancreas and serous salivary cells. Part of a cell from a retroperitoneal neoplasm in a 7-year-old boy is shown in Figure 1. The initial diagnosis by light microscopy has been lymphoma, but electron microscopy showed desmosomes, some peripheral microvilli, and abundant rough endoplasmic reticulum, in addition to the prominent granules. The ultrastructural features indicated that the tumor was an acinar cell carcinoma of the pancreas. An unexpected finding was the presence of occasional granules containing crystalline inclusions.

Burns et al[1] found large cytoplasmic granules in the cells of a lipase-secreting pancreatic acinar cell carcinoma in an adult with diffuse polyarthropathy. There were no systemic symptoms in our case, but it does not appear to be possible to determine the nature of the granule contents in these tumors from their fine structure.

Acinic cell tumors of the major and minor salivary glands characteristically contain a profusion of cytoplasmic granules of the same large size as those in salivary serous cell (Figure 2). Not suprisingly the cells have a granular cytoplasm by light microscopy, and the

granules can be seen easily in thick Epon sections. Small numbers of similar granules occur in other salivary tumors, including the benign basal cell adenoma, and adenoid cystic carcinomas, as well as in the epidermoid cells of some mucoepidermoid carcinomas. Their presence argues for a common histogenesis, probably from the intercalated duct cell.

Dense spherical granules are found in the apical cytoplasm of the tall columnar cells of the bronchiolo-alveolar form of pulmonary adenocarcinoma (Figure 3), in company with lakes of glycogen and often with mucin droplets and some lamellar bodies. The heterogeneity might be explained by derivation of the tumor from multipotent bronchiolar cells capable of differentiating into non-ciliated bronchiolar cells (Clara cells), mucin forming cells, and alveolar type II pneumocytes. Clara cells have been reported to contain dense granules that are believed to provide a protein-rich hypophase to the alveolar surfactant.[2]

Perase[3] has designated a group of polypeptide producing endocrine cells, APUD cells. The cells have different anatomic locations, but share common biochemical and morphologic features including the presence of cytoplasmic membrane-bound granules that commonly fall within the 200 to 400 nanometer range. Granules may be numerous in tumors derived from these endocrine tissues, and it is not surprising that they resemble one another ultrastructurally. Allowing some latitude for changes consequent on dedifferentiation, it may only be possible by electron microscopy to determine that a particular tumor falls within the broad group. While this information may be of some value, it can be more specific when coupled with the available clinical information. This is illustrated by the case of a 42-year-old male patient with a metastatic tumor involving neck lymph nodes. The demonstration of cytoplasmic granules (Figure 4) of the APUD size led to the suggestion that the tumor might be a metastatic medullary thyroid carcinoma, and this was confirmed by further clinical studies. Amyloid was patchily distributed in the neck metastases and did not appear in the electron microscopy sections.

It is probably not possible to distinguish carcinoid tumors from alpha cell neoplasms of the pancreatic islets by electron microscopy. We have seen liver metastases from both tumors in which the ultrastructure was identical. Figure 5 shows part of a tumor cell from a supraclavicular mass found in a 62-year-old female who some 20 years earlier had been treated for squamous carcinoma of the cervix: carcinoid tumor was suggested and a primary lesion in the terminal ileum was found on further investigation. The islet cell tumor in Figure 6 had metastasized to the liver, and the patient have the classical history of intractable peptic ulceration. Although carcinoid tumors of the hind-gut have been reported to differ in their biochemical behavior from those of fore- and mid-gut[4], their cells possess numerous cytoplasmic granules. Black[5] attempted to correlate granule size and appearance in carcinoid cells with their location in the alimentary canal and suggested that pleomorphic granules were associated with midgut tumors. It is

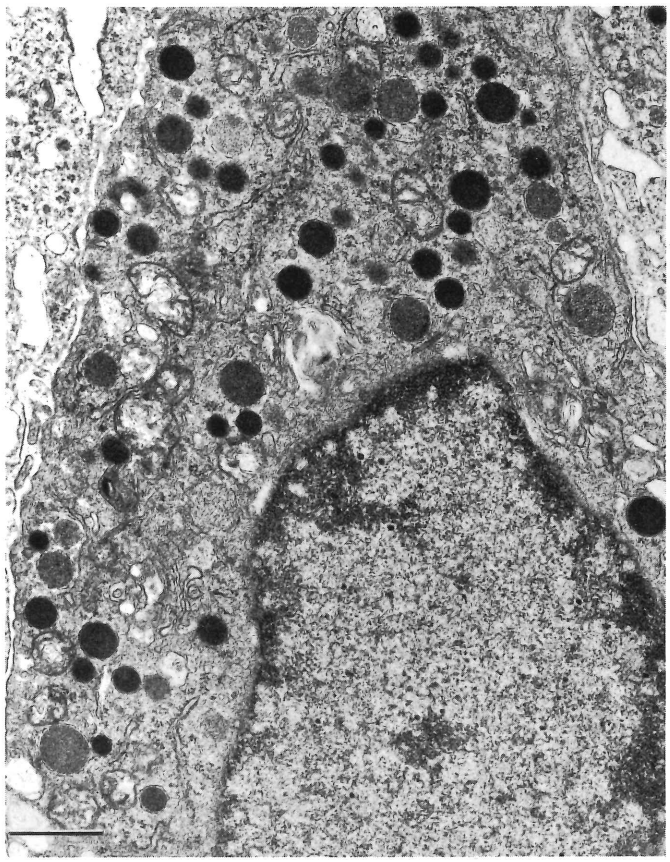

FIGURE 3 — The apical zone of tall columnar cells of a bronchiolar carcinoma.

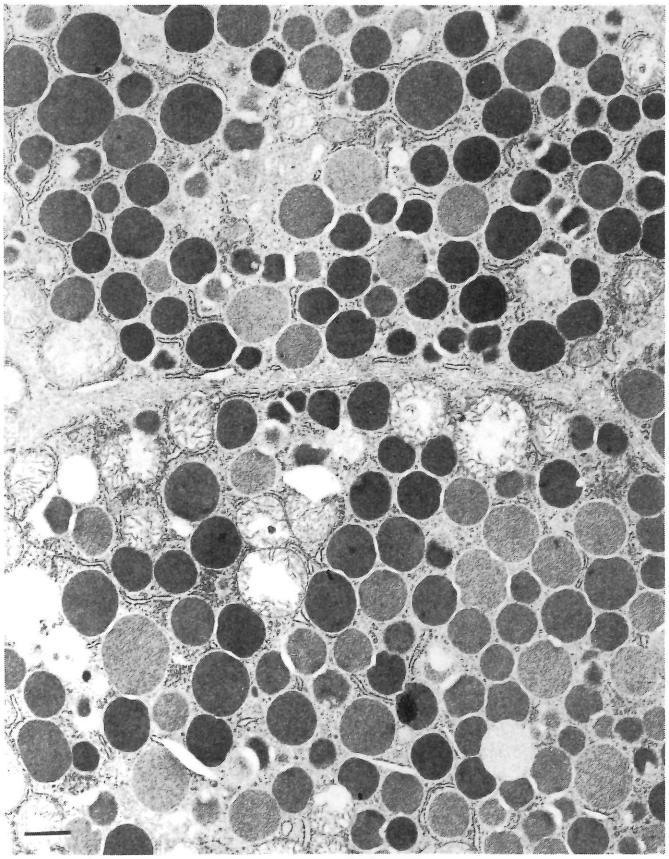

FIGURE 4 — Metastatic medullary carcinoma of thyroid in a cervical lymph node.

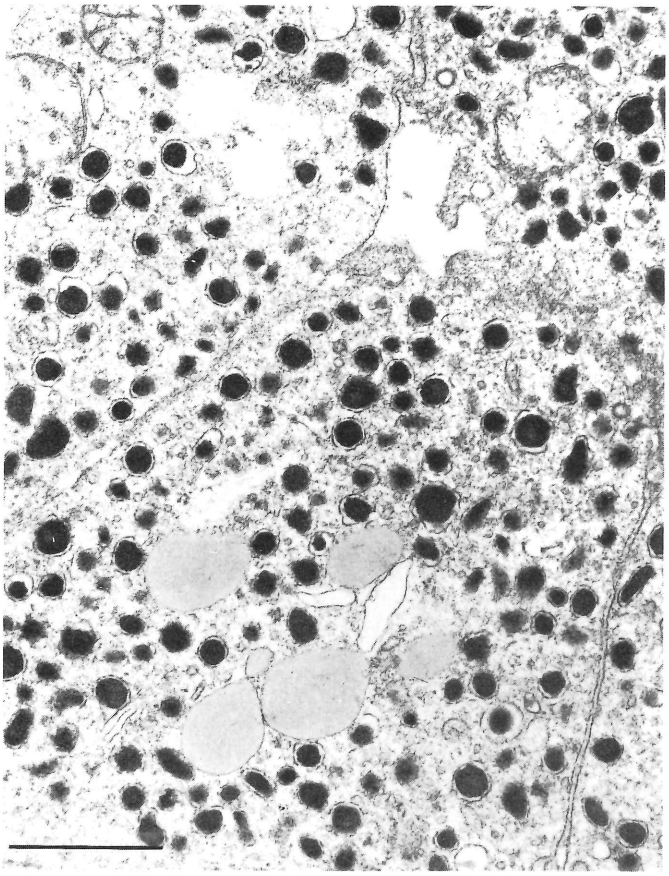

FIGURE 5 — Secretory granules and lipid droplets in cells of a carcinoid tumor that has metastasized from the terminal ileum to the neck.

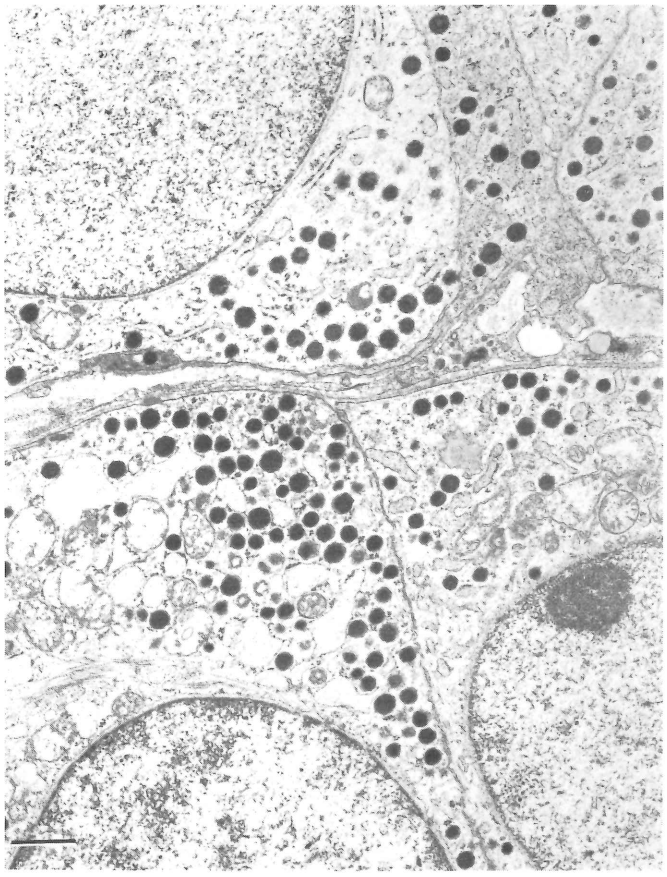

FIGURE 6 — Non-beta cell tumor of pancreatic islet origin metastatic to liver.

doubtful whether this can be relied upon to locate the primary site of a metastatic carcinoid.

In beta cell islet tumors, some cells usually contain crystalline granules, but many granules are spherical, though they may be smaller than those of the alpha cells. The nature of the delta islet cell remains controversial.[6] Attempts to link it to gastrin production are contradicted by the observation that tumor cell granules in the Zollinger-Ellison syndrome are identical to those in alpha cells. There may be two morphologically similar alpha cells in the normal islet, one producing glucagon and the other forming gastrin, in which case the designation 'non-beta cell' is more appropriate.

Studies on the human anterior pituitary, including immunoflourescent procedures and clinico-pathologic correlations in patients with adenomas, have indicated that the term chromophobe is a misnomer, whether applied to a cell in the normal gland or in an adenoma.[7] At least some granules can be demonstrated in these cells by electron microscopy: their paucity may reflect rapid uptake of hormone, or dedifferentiation with diminished production. With the possible exception of the gonadotropic hormones, it is probable that a specific cell type is responsible for the elaboration of each anterior pituitary hormone. The granules are similar in most cells, so that identification of the nature of the secretory product from the size of the granules is usually not possible. There are exceptions, however. Growth hormone producing adenomas contain granules which typify the appearance of the cells of most adenomas,

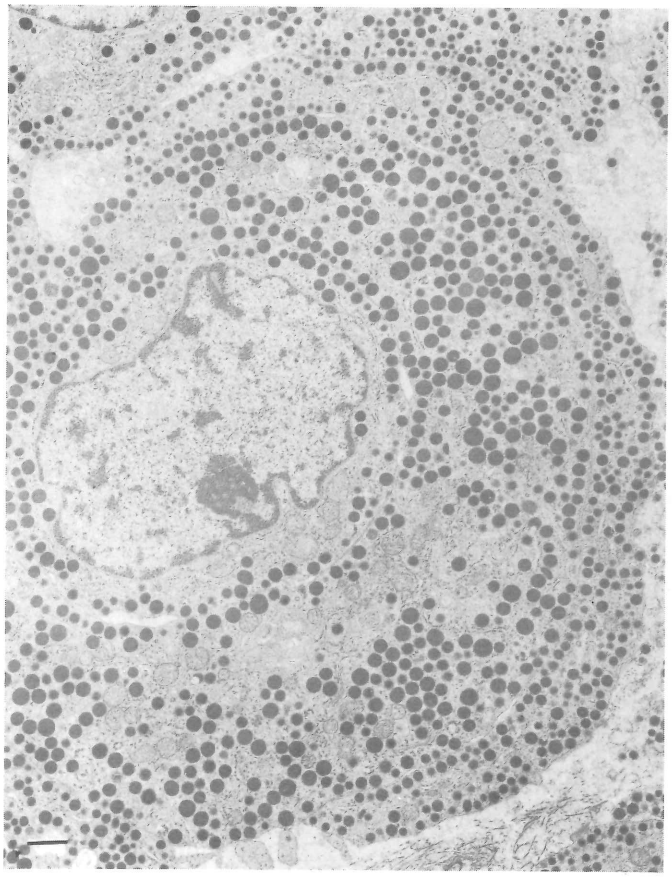

FIGURE 7 — Cell of a chromophobe adenoma of the pituitary in a patient with acromegaly.

though the granules in figure 7 are particularly numerous. In contrast, the small peripheral granules of the cell in figure 8 simulate those of the normal TSH cell, and the patient did have high TSH levels. Questions exist concerning the relationship of growth hormone and Prolactin, but in our experience the relationship of growth hormone producing adenomas generally differs from that of adenomas in patients with high Prolactin levels. The former tend to have many uniform granules (figure 7), whereas a smaller number of rather pleomorphic granules of larger average size, and numbers of lysosomes, characterize the Prolactin-secreting adenomas.

Chromaffin cells of the adrenal medulla produce epinephrine and norepinphrine, whereas in most extra-adrenal pheochromocytomas, norepinephrine. This might reflect availability of the enzyme N-methyl transferase which is produced by adrenocortical cells and reaches the medulla in high concentrations compared to its level in the peripheral blood. Norepinephrine granules have an eccentrically located dense core and a loose-fitting unit membrane (figure 9). They are not seen in carotid body tumors and other chemodectomas, though occasional cells containing angular granules are present in these lesions in addition to the predominant chief cells with their spherical granules.[8]

An unusual location for granules similar to those in most APUD cells is in the apical cytoplasm of bile duct carcinomas.[9] We have seen them in eight cases of this tumor, and they may prove to be a differentiating feature between liver cell and bile duct carcinomas. They are

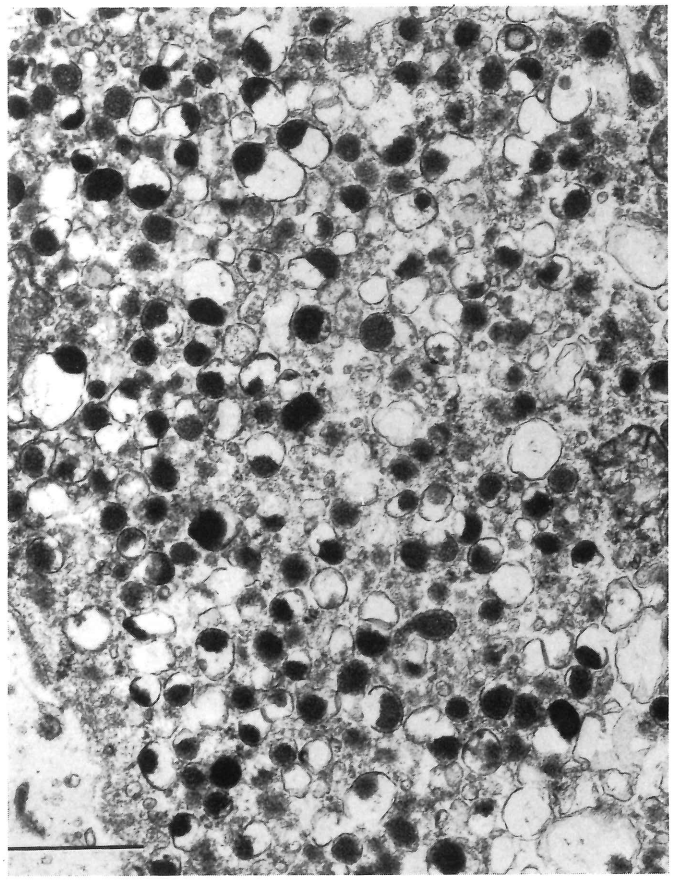

FIGURE 9 — Norepinephrine-containing granules with eccentrically-located dense cores in an extra-adrenal pheochromocytoma. pheochromocytoma.

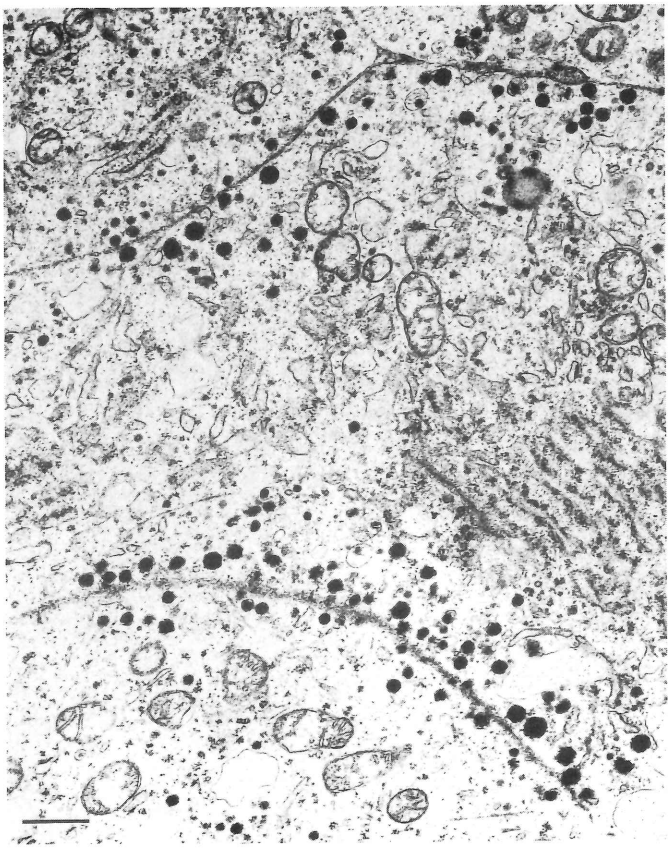

FIGURE 8 — Small, peripherally-located granules in cells of a TSH-secreting pituitary adenoma.

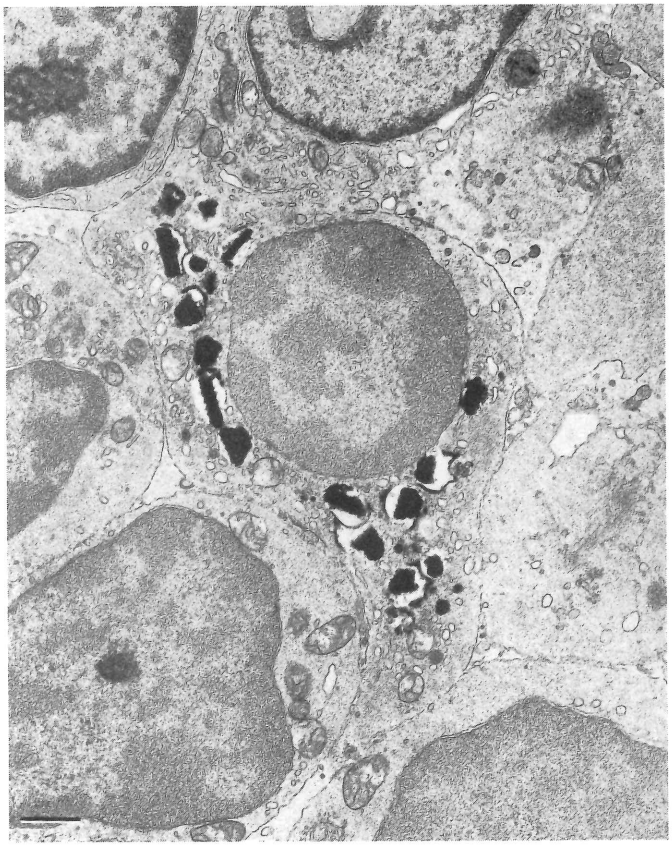

FIGURE 10 — Pleomorphic, angular granules in a thymoma cell.

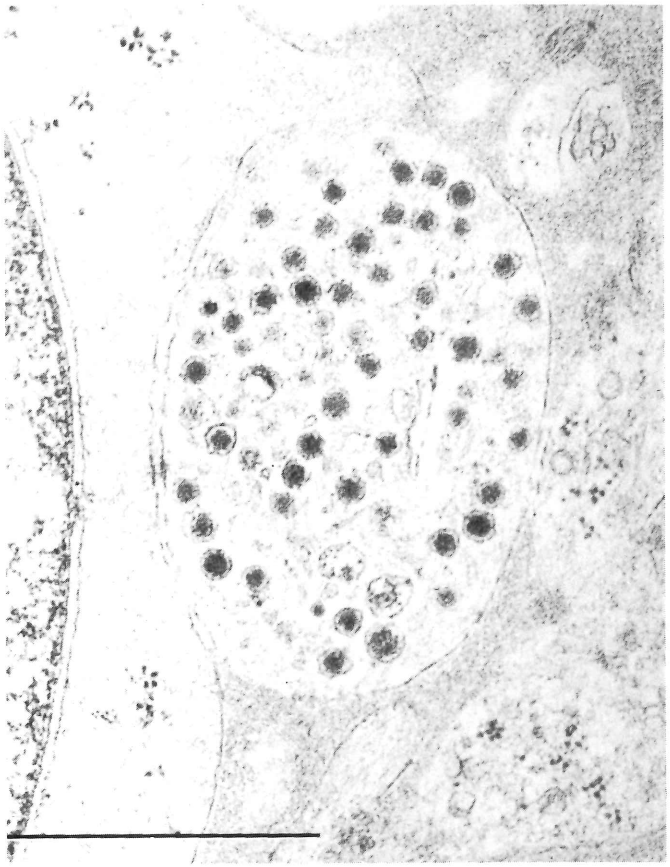

FIGURE 11 — Small granules in a dendritic process of neuroblastoma cell in a 72-year-old female. The primary tumor presented as a peri-parotid mass.

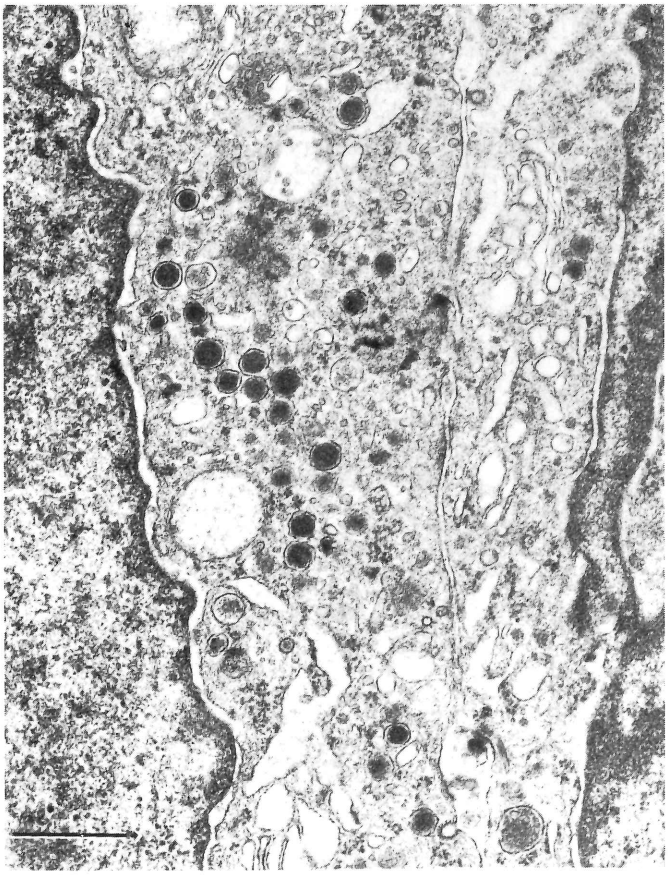

FIGURE 12 — A small area of cytoplasm from a cell of an undifferentiated (oat cell) bronchogenic carcinoma.

only seen in some of the cells, and their nature in unknown.

The role of thymic epithelial cells in the activation of T-lymphocytes is obscure, but the existence of a thymic hormone has been postulated. It is therefore interesting to observe dense, angular granules in occasional thymoma cells (Figure 10). Similar granules with irregular polyhedral profiles have been reported in a renal juxtaglomerular cell tumor that was secreting renin.[10]

Neuroblastoma cell granules are of similar caliber to adrenergic synaptic vesicles, and they are typically concentrated within dendritic cytoplasmic processes (Figure 11). The number of granules varies, and they may be sparse in poorly differentiated tumors. Neuroblastoma may occur in adult patients, and therefore enters into the differential diagnosis of a small round cell neoplasm irrespective of the age of the patient.[11] Granules are encountered in occasional neurosarcomas, but their significance is not understood. Much remains to be elucidated concerning the relationships of tumors of the peripheral nervous system and their histogenesis.

Small cell undifferentiated carcinomas of the lung (oat cell carcinomas) have been found to contain small cytoplasmic granules, and their presence led to the suggestion that these tumors might be undifferentiated carcinoid tumors, [12] a hypothesis that has often been repeated but never proven. Some oat cell carcinomas are probably derived from bronchial reserve cells. In our experience, the granules are rarely present in considerable numbers, and may be difficult to find in some tumors. The concentration in the cell shown in Figure 12 is more dense than in most of our cases. The nature of the granules is not known. Further studies on oat cell carcinomas associated with ectopic humoral syndromes would be valuable. Morphologically similar neoplasms have been reported in the head and neck region, and until more is learned of their fine structure, it can not be assumed that a small cell carcinoma in this location is a metastatic bronchogenic tumor.

It may be concluded that the presence of cytoplasmic granules in tumor cells is a feature that will at least narrow the differential diagnosis and may specifically determine the tumor type. Close correlation with available clinical data is essential in order to glean the greatest possible benefit from the ultrastructural observations. The electron microscopist must be cautious in drawing conclusions from poorly preserved material, since lysosomes can mimic secretory granules, and should exercise restraint in drawing diagnostic conclusions from poorly differentiated neoplasms.

Acknowledgement: We wish to thank Mrs. Joyce Cox and Miss Diana Garza for their able technical assistance.

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Comments on Point Source Enlargers

Point source enlargers are used in many laboratories for printing electron micrographs. They enhance image detail above that attainable with the more conventional types of enlargers and improve the general appearance of the micrographs as well as the amount of information that can be obtained from them. Point source enlargers also increase image contrast up to a factor equivalent to one full grade of paper.

Point source enlargers derive their name from the form of illumination used. This is typically a low-voltage, small-diameter, tungsten-filament light bulb substituted for the more conventional frosted bulb. The light intensity from these bulbs may be as much as 30 to 60 times that attainable from frosted bulbs. The enhanced intensity is particularly helpful when printing negatives exposed and developed for maximum density and contrast. Mercury arc and other gas-filled lamps are available also for most enlargers and offer the advantages of a more concentrated source of illumination (i.e., a true point source) and sometimes an even greater illuminating intensity.

Point source enlargers are operated like other enlargers except that (1) the light is focused and centered so as to obtain optimal illumination and (2) the enlarging lens is used with maximum aperture opening or no more than one f-stop down from the maximum aperture opening. Both the condenser lenses and the enlarging lenses must be of excellent quality to keep lens defects from marring print quality.

In addition, extreme care must be taken to keep the condenser lenses clean. Dust or dirt on the condenser lenses is focused onto the printing surface and can mar an otherwise excellent print.

There are probably only three characteristics of point source enlargers that appear unusual to the novice and that may cause concern. These are illustrated in Figs. 1-4. The first characteristic is that a subdued filament image is present in the center of each print (Fig. 1). This image is generally masked by picture detail and seldom, if ever, noticed in the final print.

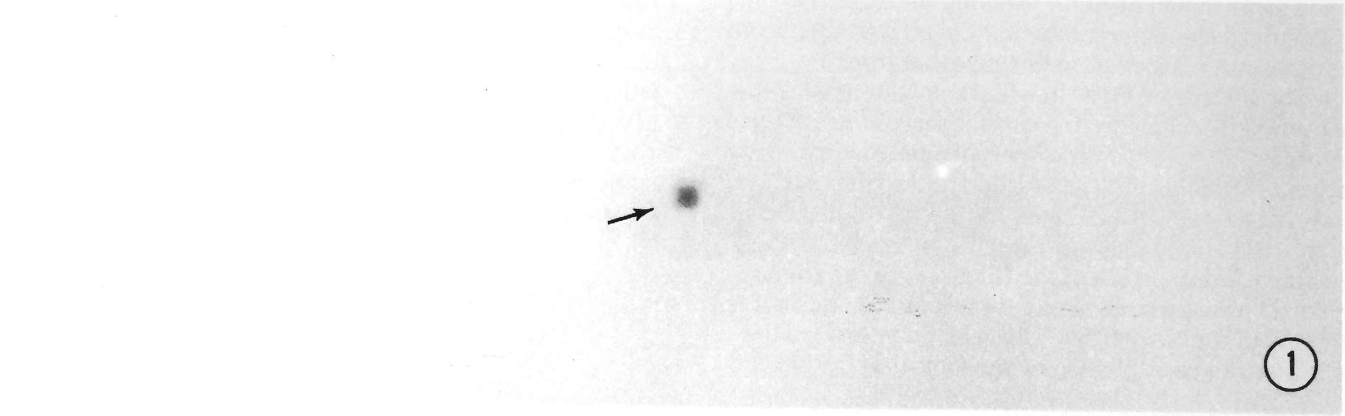
The second characteristic is that light passing around the edges of an unmasked negative, produces a diffuse dense spot in the center of the print (Fig. 2). Thus, the negative holder for a point source enlarger should be designed to fit the negative being enlarged or should

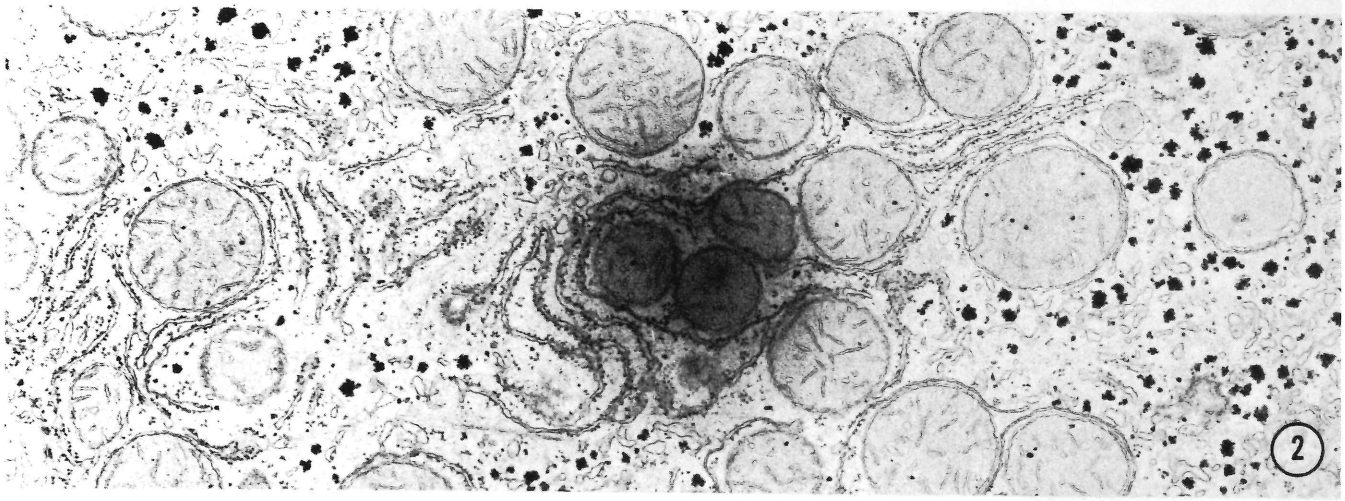
FIGURE 1. An illuminated area from a point source enlarger (arrow) showing the filament image typical of the tungsten filament type of point source enlarger. The size of the spot is equivalent to that in an 8 X 10" print made from a 3 1/4 X 4" negative. Note also that the illumination from a tungsten filament point source is not even. The white specks in the print are due to dust on the condensor lenses.

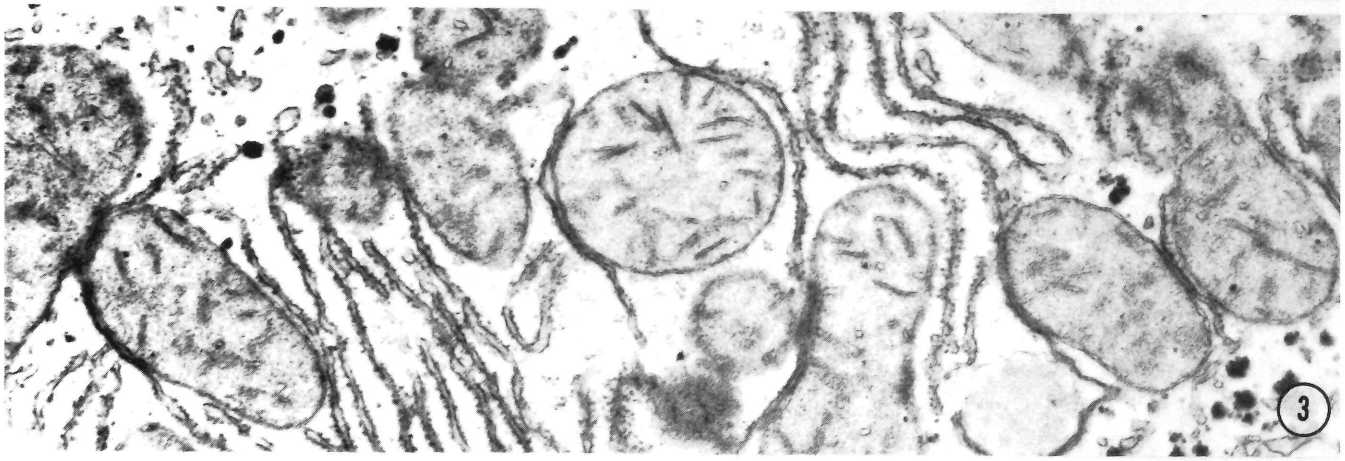
FIGURE 2. A part of an 8 X 10" print made from a 3 1/4 X 4" negative in a 4 X 5" glass negative carrier. The negative was not masked and light was allowed to pass around the edges of the negative. The black central spot results from improper negative masking. Note that the print was made on very high contrast printing paper to enhance detail.

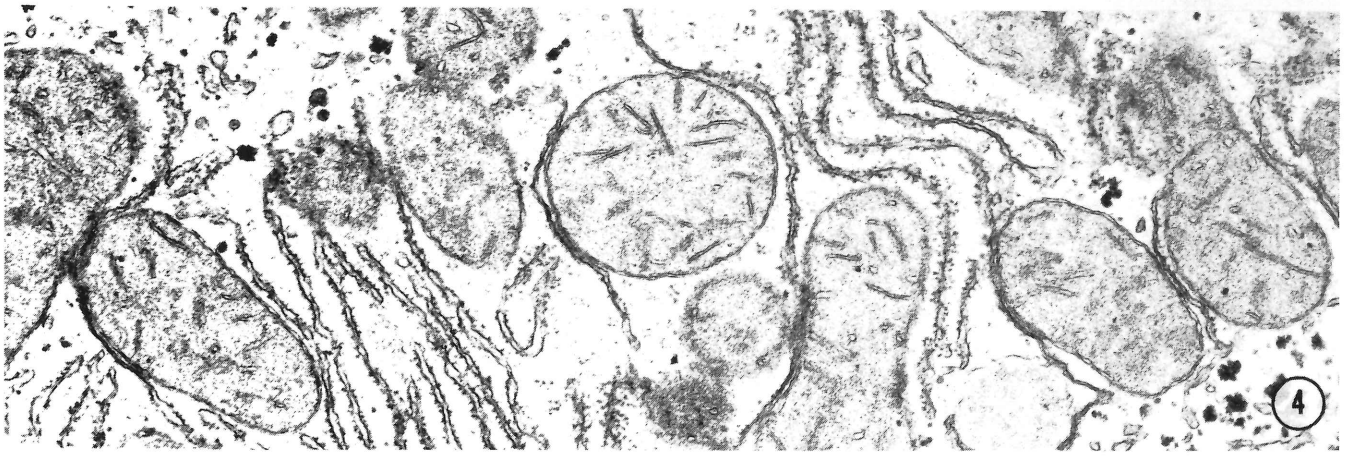
FIGURE 3. A "burned" polycontrast filter was used to make this print. Note the lack of sharpness of picture detail.

FIGURE 4. Same as Fig. 3 except that a good polycontrast filter was substituted for the "burned" one.









contain some mechanism for masking the negative.

The third characteristic is that the intense light from the point source (often 30 to 60 times that from a conventional frosted bulb) may burn polycontrast filters. The burned filters distort the central part of the enlarged image (Figs. 3, 4). The burned part of a polycontrast filter appears as a small, subtle, distortion of the filter surface, about 1/8 inch in diameter, near the center of the filter. The spot is difficult to recognize but can be seen by light reflecting off the surface of the filter. In my experience, this defect has appeared about every one and one-half to two years in the No. 3 filter. The selectivity toward the No. 3 filter can be explained by the facts that the No. 3 filter is heavily used and that it is dark enough to trap a large proportion of the light infringing upon it.

In spite of these special characteristics, point source enlargers are a worthwhile, and almost necessary, addition to the electron microscope laboratory. They are easy to use and yet significantly enhance both the appearance and the informational content of most electron micrographs.

HILTON H. MOLLENHAUER
Veterinary Toxicology and
Entomology Research
Laboratory, ARS, USDA
College Station, Texas

FINANCIAL REPORT

Period Ending August 23, 1976

Total assets April 3, 1976		$ 6734.44
Certificate of Deposit (University Bank #4470)		1161.76
Certificate of deposit (Fannin Bank #17864)		1000.00
Savings account (Fannin Bank #12-0900043)		3058.16
Balance in checking account April 3, 1976		1514.52
RECEIPTS		
Corporate dues	$ 1050.00	
Member dues	1120.50	
Registration (Spring)	494.75	
Corporate contributions	50.00	
Total income	$ 2715.25	2715.25
		4229.77
DISBURSEMENTS		
Secretarial expense	$ 1051.92	
Arlington meeting	1105.28	
Newsletter (Spring)	26.05	
Total expenses	$ 2183.25	- 2183.25
Balance in checking account August 23, 1976		2046.52
SAVINGS ACCOUNTS		
Certificate of deposit (University Bank #4470)		1179.31
Certificate of deposit (Fannin Bank #17864)		1000.00
Savings account (Fannin Bank #12-0900043)		3114.25
TOTAL ASSETS of TSEM as August 23, 1976		**$ 7340.08**

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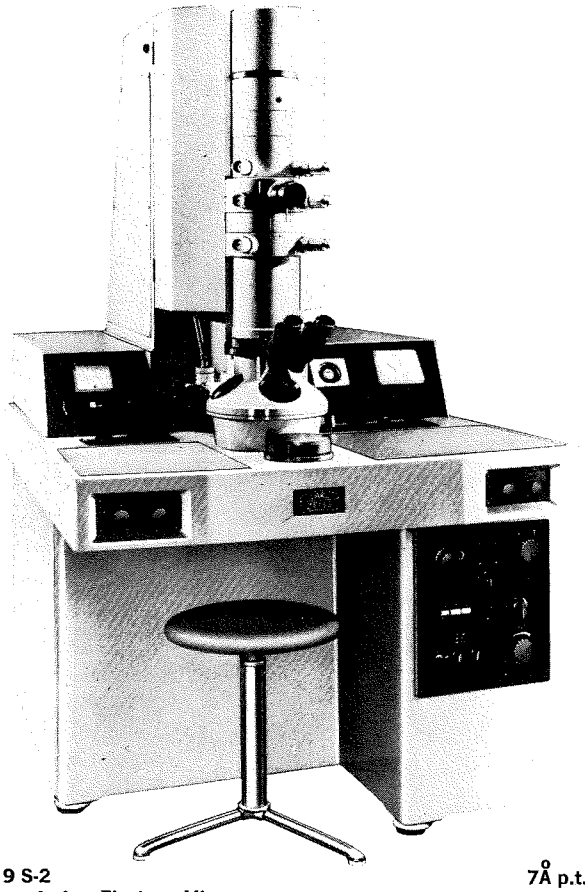

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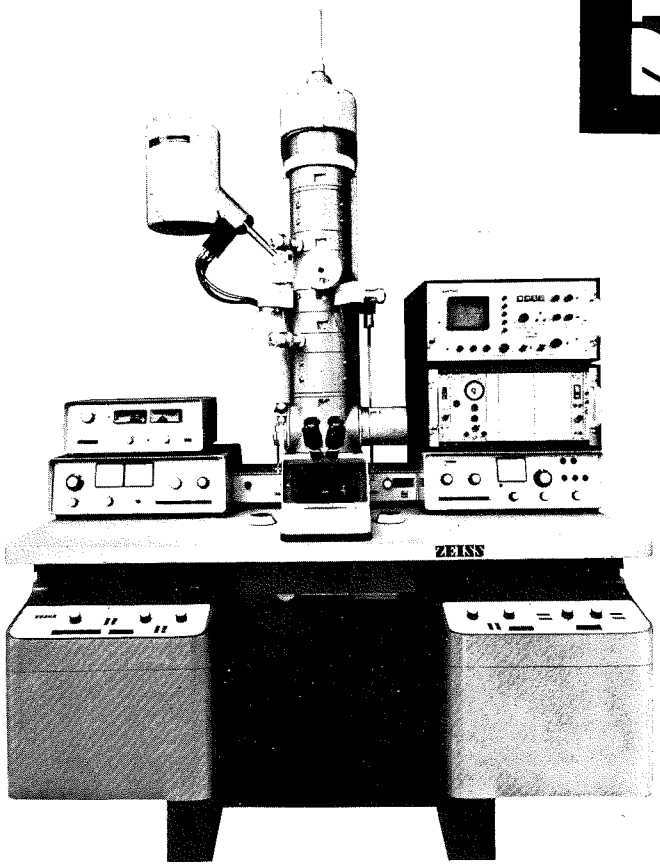

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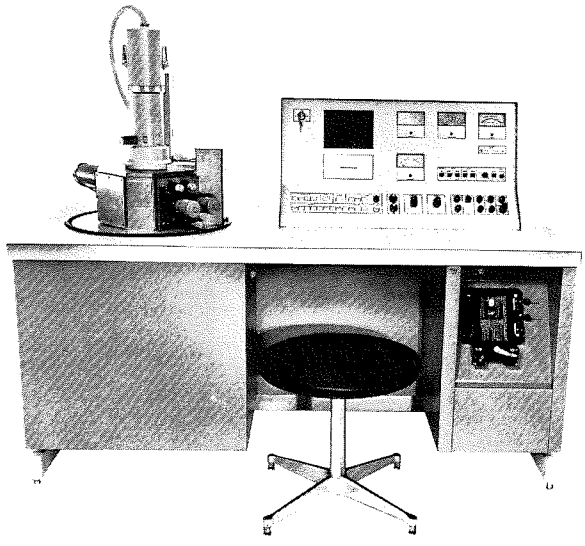

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Abstracts

AN ULTRASTRUCTURAL STUDY OF CHRONIC PYELONEPHRITIS IN NON-HUMAN PRIMATES: MACACA ARCTOIDES AND MACACA MULATTA. T. Woodie Smith, Jr., James A. Roberts, and B. J. Martin. A co-operative study of the Delta Regional Primate Center of Tulane University School of Medicine, and the Biology Department of the University of Southern Mississippi, Hattiesburg, 39401.

Bacterial infection can and does destroy the kidneys; yet many aspects of chronic pyelonephritis remain unexplained. The non-specific pathology, the failure to recover bacteria from the kidney or urine, and the frequent inability of antibacterial therapy to affect the course of the disease, suggest that factors in addition to infection may be damaging the kidney. It has been suggested by Roberts (1975) that the immune response may be involved. The present study is an ultrastructural characterization of renal tissue in *M. arctoides* (stumptail monkey) and *M. mulatta* (rhesus monkey) in which an ascending infection of *Escherichia coli* by means of retrograde catheterization of one ureter was induced. The innoculum was infused at high pressure (approximately 150 mm Hg) to mimic vesicoureteric and intrarenal reflux, and was administered one week following the initiation of immunosuppression by cyclophosphamide. Future studies will involve determining if cyclophosphamide can alter the course of a renal infection, if cell-mediated immunity results in the destruction of renal parenchyma, and if vesico-ureteric reflux alone can damage renal tissue.

ATYPICAL SMALL ROUND CELL TUMORS. Bruce Mackay, John J. Gillespie, and James J. Butler, Department of Pathology, The University of Texas System Cancer Center M.D. Anderson Hospital and Tumor Institute.

The term 'small round cell tumor' is an imprecise but convenient designation for a heterogeneous group of neoplasms composed of uniform spherical and ovoid cells that display little or no architectural organization. Because of their similarities in light microscopic sections, they may pose a diagnostic problem, and the clinical setting is often not helpful. The ultrastructural features of each tumor are distinctive, however, and electron micorscopy can usually determine the tumor type. Occasionally, ultrastructural findings are not characteristic of any of the recognized neoplasms, and the question then arises whether one is dealing with a new entity or a dedifferentiated variant. A number of these atypical cases will be presented and discussed.

NON-UNIFORM DISTRIBUTION OF BACTERIA ON MEMBRAME FILTERS. Tom Dreier, Dept. Biology, Electron Microscopy Center, Texas A&M University, College Station, Texas 77843.

Distribution of cells on membrane filters is generally considered homogeneous for the enumeration of bacteria. Scanning electron microscopy revealed that the distribution of bacteria on membrane filters is distinctly bimodal. Patches without any bacteria constituted 30% of the total filtering area. Vacuum pressure, filter type, filter side, filter holder, and wetting agents were variables tested to determine their effect on distribution patterns. Different filter holders altered the percentage of the area that does not contain any bacteria; however, a bimodal distribution continued to exist. Pre-wetting the filter with a wetting agent instead of distilled water prior to mounting on the filtering apparatus gave a distribution that approaches normality. The remaining variables did not contribute significantly to the distribution pattern.

AN ULTRASTRUCTURAL AND PHYSIOLOGICAL CHARACTERIZATION OF HEDONIC GLANDS FROM THE RED-SPOTTED NEWT. Thomas B. Pool, The University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, Texas 78284.

The ultrastructure of hedonic glands from the red-spotted newt has been studied by transmission and scanning electron miscroscopy. Additionally, the hormonal regulation of product synthesis and the neural control of product release have been characterized. Hedonic glands are simple alveolar, merocrine glands that synthesize and sequester large amounts of a glycoproteinaceous product during the fall, winter, and spring months (breeding season). The secretory cells contain abundant rough endoplasmic reticulum, active Golgi complexes, and numerous secretory granules bordering lumina distended with stored product. In contrast, secretory cells from non-breeding animals are quiescent in the secretory process and lumina of glands are greatly reduced in size. Secretory activity was induced out of season by treatment with exogenous proclactin and testosterone administered in combination but not by prolactin or testosterone administered alone. Hedonic glands were seen to expel product stored in lumina in response to cholinergic stimulation, both *in vivo* and *in vitro*. Supported by 5-TO1-HD00430 from the National Institute of Child Health and Human Development. Work was completed at the University of Virginia (Dept. of Biology).

SOME COMMENTS ABOUT POINT SOURCE ENLARGERS. Mollenhauer, H. H. Veterinary Toxicology and Entomology Research Laboratory, ARS, USDA, P. O. Drawer GE, College Station, Texas 77840.

There are probably only three characteristics of point source enlargers that appear unusual to the novice and that may cause concern. The first characteristic is that a subdued filament image is present in the center of each

print. This image is generally masked by picture detail and seldom, if ever, noticed in the final print.

The second characteristic is that light passing around the edges of an unmasked negative, produces a diffuse dense spot in the center of the print. Thus, the negative holder for a point source enlarger should be designed to fit the negative being enlarged or should contain some mechanism for masking the negative.

The third characteristic is that the intense light from the point source (often 30-60 times that from a conventional froster bulb) may turn polycontrast filters. The burned part of a polycontrast filter appears as a small, subtle, distortion of the filter surface, about 1/8 inch in diameter, near the center of the filter. The spot can be recognized easily by light reflecting off the surface of the filter.

IN SITU EMBEDDING METHOD OF TISSUE CULTURE CELLS IN BEEM CAPSULES FOR IMMUNOELECTRON MICROSCOPY STUDIES. Y. Ohtsuki, L. Dmochowski, G. Seman, J. M. Bowen, and M. Scanlon. Department of Virology, The University of Texas, M. D. Anderson Hospital and Tumor Institute, 6723 Bertner Ave., Houston, Texas 77030.

A new technique of *in situ* embedding of cells grown in BEEM capsules has been devised for immunoelectron microscopy (IEM) studies. This technique is a modification of the method of Eppig *et al.* (In Vitro 12:65, 1976). It requires very small amounts of antisera and conjugates. Processing and embedding are much easier, and more than 20 different specimens can be handled at one time. About 30,000 to 50,000 tissue culture cells per capsule were cultured for one or two days on carbon-coated lids of inverted BEEM capsules sterilized with enthanol. After prefixation in 1% acrolein or 2% paraformaldehyde the cells were incubated for 30 min. with 30-50 μl of antisera, then with ferritin or peroxidase conjugates for the same time, and fixed in 3% glutaraldehyde. For the immuno-peroxidase method, the cells were then incubated in 3-3-diaminobenzidine solution. The cells in both methods were postfixed in OsO_4, dehydrated and epon embedded in the same BEEM capsules. The embedded cell layers were trimmed under light microscope, and sectioned horizontally. This method gave good results in known oncogenic virus systems, such as mouse mammary tumor virus and murine sarcoma virus. Furthermore, by this method, sera of 12 cases of prostatic carcinoma, benign hyperplasia and of normal donors positive by fixed immunofluorescence (FIF) gave ferritin labeling of type C virus particles and plasma membranes in cells of Soehner-Dmochowski murine sarcoma virus infected mouse prostate tissue culture. Absorption of the sera with guinea pig kidney powder removed both FIF and IEM reactivity. These results indicate that this method is useful, reliable, and repeatable in IEM studies. Supported by Grant CA-15438 from the National Cancer Institute, NIH, USPHS.

A COLD STAGE DEVICE FOR SEM. J. R. Scott, Biology Dept., Electron Microscopy Center, Texas A&M University, College Station, Texas 77843.

The "heat sink" principle used in this cold stage device can be adapted for use in any SEM which is equipped with a bulk specimen holder. The use of this type device can extend the SEM capabilities of almost any lab into the realm of cryogenic applications. The idea will be presented and a cold stage device adaptable to the JSM-35 will be shown along with results from our use of the device!

CONCENTRATION OF ELEMENTS IN MITOTIC CHROMATIN AS MEASURED BY X-RAY MICRO-ANALYSIS. I. L. Cameron, R. L. Sparks, K. L. Horn and N. R. Smith, Department of Anatomy, the University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, Texas 78284.

Unfixed frozen-dried and uncoated tissue sections of the mouse duodenum were placed on carbon planchets and analyzed in a scanning electron microscope fitted with energy dispersive X-ray equipment. Computer analysis of the X-ray spectra allowed elemental microanalysis of the nucleus, cytoplasm and mitotic chromatin regions in the cryptal and villus enterocytes. The peak to background ratio of S, Cl, K and Ca were higher in mitotic chromatin than any of the other sites measured. The redistribution of Ca at mitosis is postulated to help explain both chromosome condensation and assembly of the mitotic spindle apparatus.

THE DISAPPEARING SUBSTRATE PROCEDURE — ELECTRON MISCROSCOPY OF TISSUE CULTURE CELLS. P. S. Baur, G. F. Barratt and R. E. McManus. Department of Human Biological Chemistry and Genetics, University of Texas Medical Branch, Galveston, Texas 77550.

Cultured human fibroblasts were grown on an intermediary parlodian substrate deposited in the surface of glass slides, coverslips, or petri plates. The cells were fixed, post fixed, and dehydrated *in situ* and then released from the surface by dissolving away the parlodian substrate using propylene oxide. Following embeddment in the Epoxy resin mixture the cells were sectioned and examined by light and electron microscopy. Examinations revealed that the fine structure and inherent cellular configurations were maintained by this process. Ruthenium stained glycocalyces found mainly on the upper surfaces of all cells were likewise maintained by this procedure. The use of this procedure allows the production of cell pellets without the necessity of first trypsinizing the cells prior to fixation.

This work was supported by the Shriners Burns Institute, Galveston, Texas; the National Foundation March of Dimes; NIH Grant AM 17040; and NIH Training Grant GM 07204.

ULTRASTRUCTURAL AND FLOW MICROFLUOROMETRIC ANALYSIS OF CHROMATIN IN SYNCHRONOUS X-IRRADIATED CHINESE HAMSTER CELLS. S. S. Barham, R. A. Walters, R. A. Tobey, and L. R. Gurley. Cellular and Molecular Biology Group, Los Alamos Scientific Laboratory, University of California, Los Alamos, New Mexico 87545.

Various biochemical and psysiological parameters of mammalian cells, including fluctuations in the dCTP acid-soluble pool, DNA replication rates, and phosphorylation rates of histones, rapidly follow X-irradiation. The degree of sensitivity of these various parameters to X-irradiation is dependent on the stage in the cell's life cycle at which radiation occurs. In the present study, an ultrastructural investigation of interphase chromatin following X-irradiation of synchronized Chinese hamster (line CHO) cell populations was undertaken. Cell populations were synchronized by mitotic selection and hydroxyurea block. Synchronized populations were irradiated in mitosis, 1 hr after release from mitosis (G_1), just prior to release from hydroxyurea (S/G_2). and 5.5 hr after release from hydroxyurea (S/G_2). Cell population distributions were determined both before and after irradiation by rapid flow microfluorometric analysis. Computer analysis was used to determine the percentage of cells in each phase of the cell cycle. The degree of visual radiation damage in synchronized cell populations correlated well with the differential degree of biochemical and physiological changes found to take place in the cell in previous studies. The S/G_2 cell population was determined to be the most radioresistant, followed in order by G_1, G_1/S, and mitotic populations. Multiple anomalies observed in thin sections of interphase chromatin will be discussed. (This work was performed under the auspices of the U. S. Energy Research and Development Administration.)

INTRACYTOPLASMIC DESMOSOME FORMATION IN TWO SQUAMOUS CELL CARCINOMAS GROWN IN VITRO. Cameron E. McCoy, William B. McCombs, Albert Leibovitz, Kenneth Mazur, Debbie Mabry and James C. Stinson. Department of Tissue Culture and Virology, Scott and White Clinic, Temple, Texas 76501

Intracytoplasmic desmosomes have been observed in keratoacanthoma (a benign skin lesion), Bowen's disease (a malignant, non-invasive skin lesion), and squamous cell carcinoma. Whether this location resulted from phagocytosis, cytoplasmic infolding, or intracytoplasmic new formation has been unclear.

Two tissue cell lines derived from squamous cell carcinomas have maintained the capability to form intracytoplasmic desmosomes through repeated passages. De novo formation of the intracytoplasmic desmosomes is implied from the in vitro observations of these cells. An alteration in membrane formation or recognition may account for the failure of these tumor cells to properly orient some of their desmosomes.

FREEZE-FRACTURE ULTRASTRUCTURAL ALTERATIONS INDUCED BY FILIPIN, PIMARICIN, NYSTATIN AND AMPHOTERICIN B IN THE PLASMA MEMBRANES OF EPIDERMOPHYTON FLOCCOSUM AND RED BLOOD CELL. Y. Kitajima*, T. Sekiya and Y. Nozawa, Dept. of Biochemistry, Gifu University School of Medicine, Gifu, Japan. *Present address, Dept. of Botany, The University of Texas at Austin.

The effects of chemically different polyenes on the plasma membranes of a human pathogenic fungus, *Epidermophyton fluccosum* and red blood cells were studied by freeze-fracture electron microscopy. Each type of neutral (filipin), small amphoteric (pimaricin) and large amphoteric (nystatin and amphotericin B) polyenes produces a distinct morphological effect on the fungal membranes: 1) Pit formation type. Filipin produces 250 to 300 A diameter "pits" or "invagination" both in ergosterol-containing fungal plasma membranes and cholesterol-containing red blood cell ghost membranes. 2) Network particle aggregation type. The small amphoteric polyene, pimaricin, produces a network of membrane-particle aggregations which encloses 1,000 A diameter particle-free areas in fungal membranes. These areas are slightly elevated toward the outside of the cell. 3) Random particle aggregation type. The large amphoteric polyenes, nystatin and ampotericin B, cause a random segregation of the fungal plasma membranes and red blood cell ghost membranes into particle-free and aggregated areas. It is concluded that these morphological differences are due to different mechanisms of polyene-sterol interaction in which the different size of the macrolide ring in the antibiotic structure may be involved.

THE GLYCOCALYX OF CYSTIC FIBROSIS DIPLOID FIBROBLASTS IN VITRO — A RUTHENIUM RED/SEM/EDAX STUDY. P. S. Baur, S. C. Barranco, and G. F. Barratt. Department of Human Biological Chemistry and Genetics, University of Texas Medical Branch, Galveston, Texas 77550.

Exponentially growing cystic fibrosis fibroblasts were prepared for SEM analysis using a Ruthenium Red/PIPES buffer/glutaraldehyde/OsO_4 fixation regimen. Topological studies of these populations revealed the presence of classical transformed cells with flattened configurations and more or less devoid of complicated surface details. Normal and CF-heterozygote cells were similar in detail. When these cells were surveyed by Energy Dispersive X-ray Analysis (EDAX), on a cell by cell basis for ruthenium content, it was observed that significant differences existed between the three populations. At the time of growth when normal cells demonstrate an increased capacity for the uptake of tridiated thymidine when compared to the levels found in CF homozygotes and CF heterozygote counterparts, there is a concomitant reduction in the average amount of ruthenium found on the surface of the normal cells. The CF homo and hetero cell ruthenium content did not show this depletion. Accompanying TEM studies of these same cells demonstrated the preferential affinity of the ruthenium in or on the glycocalyces of the cells. Additionally, the largest concentrations of the glycoprotein were mainly observed on the upper cell surfaces.

This research was supported by NIH Grant AM 17040 and the Shriners Burns Institute, Galveston, Texas.

MYOFIBROBLASTS AND SCAR CONTRACTION. P. S. Baur[1], H. Linares[2], and G. F. Barratt.[1]. [1]Department

of Human Biological Chemistry and Genetics, University of Texas Medical Branch, Galveston, Texas 77550; and [2]Shriners Burns Institute, Galveston, Texas 77550.

Surgical biopsies were obtained from a 9-year-old black female at 108 days and 122 days post burn. Biopsies were taken on the line of maximal tension from the left wrist and left forearm (contracture scar tissues), and the right elbow (hypertrophied scar tissue). The biopsies were taken before and after traction therapy which was applied to straighten the contracted arms. Observations reported here were similar in the tissues both prior to and after the two-week pressure therapy. This was as expected since the treatment was not of sufficient duration to significantly change the tissue structure. Light microscope examination (1μm thick sections stained with methylene blue-Azure II) revealed parallel rows of long fibroblastic cells in the deep dermis of the elbow. Sections from similar areas of the wrist and forearm contained fibroblastic cells which were omni-directional. Immuno-flourescence techniques demonstrated the presence of actin in the fibroblastic cells. These findings correlated well the ultrastructure of the tissues. Virtually 100% of the fibroblasts were myo-fibroblasts, i.e., contained one or more contractile bundles (actin microfibrils). This observation was true for all three biopsy sites both before and after therapy. In addition, an extracellular fibrillar material was observed at the surface of many of the myofibroblasts. Histochemically, this materiial gave a positive reaction for acid mucopolysaccharides by alcian blue and ruthenium red staining. The results of this study suggest that myofibroblasts may be the underlying cause of scar contracture and hypertrophy.

Supported by the Shriners Burns Institute, Galveston, Texas.

TEM STUDIES OF CELLULAR GLYCOCALYCES FOLLOWING DETACHMENT PROCEDURES. Susan M. Cox and P. S. Baur. Department of Human Biological Chemistry and Genetics, University of Texas Medical Branch, Galveston, Texas 77550.

It has long been known that the detachment of cell monolayers from the substratum could be accomplished by applying mechanical forces, enzymatic treatment or chelating agents. Trypsin and other proteolytic agents partially destroy or at least reversibly damage internal structures and/or surface proteins (glycocalyx) while mechanical removal results in irreversible damage (breaks) in the external membranes resulting in some cell death. The purpose of the present study was to compare the ultrastructure, with particular emphasis centered on the glycocalyx, of Chinese hamster ovary cells detached from the substratum by the calcium chelating agent EGTA and by trypsinization.

The ultrastructural studies confirmed the destruction of surface proteins by trypsinization. It was found that 0.025% trypsin for 5 minutes totally removed the cells' glycocalyx and formed spherical cellular configurations. Cells detached from the substratum with EGTA for 5 minutes were likewise spherical but their glycocalyx remained intact. These findings suggest that EGTA may be the method of choice for cell detachment procedures if preservation of the surface glycoproteins of the cell are important factors in the research endeavors.

This work was supported in part by the Shriners Burns Institute, Galveston, Texas and by NIH HL 19048.

PROTEIN LOCALIZATION IN PNS MYELIN USING LACTOPEROXIDASE IODINATION. Richard G. Peterson and Ronald W. Gruener, Department of Neurobiology and Anatomy, The University of Texas Medical School at Houston, Houston, Texas.

Lactoperoxidase iodination has previously used to study the localization of proteins in various membrane systems, including red blood cells (Phillips and Morrison, *Biochemistry*, 10: 1766, 1971) and CNS myelin (Poduslo and Braun, *J. Biol. Chem.*, 250:1099, 1975). In this study, lactoperoxidase iodination was used to study the localization of proteins in PNS myelin. Whole split sciatic nerves from mice were iodinated using the method of Hogg (*Proc. Nat. Acad. Sci.*, 71:489, 1974). Nerves were swollen with distilled water before iodination in order to introduce lactoperoxidase into the intraperiod band. Myelin was prepared from the nerves which were iodinated and gels (of prepared myelin samples) were run (Fairbanks *et al.*, *Biochemistry*, 10:2606, 1971). After staining and scanning, the gels were sliced into 1mm. segments and the ^{125}I in each slice was counted. Comparison of gel scans and iodine labeling indicated that glycoprotein P_0 was labeled while the basic proteins, P_1 and P_2, were not labeled. These results indicate that the P_0 protein is exposed in the intraperiod band, or outer surface, of the myelin membrane, while basic proteins are localized in the main period band, or inner surface.

SEM VISUALIZATION OF CELL SURFACE MATERIAL ASSOCIATED WITH NORMAL NEURULATION AND RACHISCHISIS, Robert W. Rice, Program in Medicine (Anatomy), Texas A&M University, College Station, Texas 77843.

Transmission electron microscopic observations indicate that glycoproteinaceous cell surface material (CSM) physically links the neural ridges and folds during their eruption, covergence and fusion, which encompasses the embryonic stage of neurulation. There is similar evidence associating CSM with the apposition and fusion of the palatal folds. Although the precise role of CSM is incompletely understood, a number of morphological and bio-chemical studies suggest that CSM actually represents an adhesive binding the adjacent cells until physical contact is made. To affirm this interrelationship between CSM and neural fold fusion, amphibian embryos were treated with lithium cloride, a compound known to produce regional failure of neural tube closure. This condition is clinically termed rachischisis, one of a family of congenital defects generally known as spina bifida. CSM is consistenly absent in areas of neural tube patency and evident in regions of fusion. Although the operative mechanisms are unknown, these and other results suggest that development of birth defects such as rachischisis and cleft palate is associated with a localized disruption of CSM synthesis.

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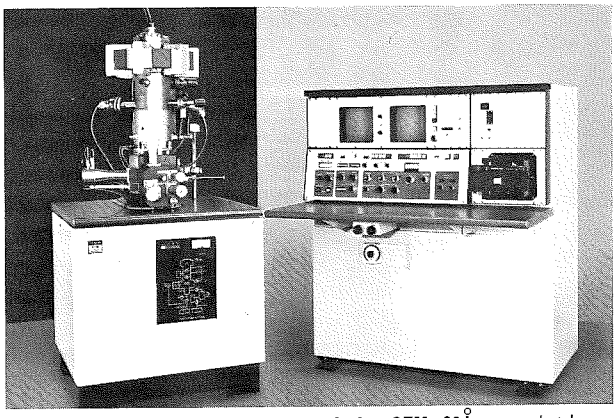

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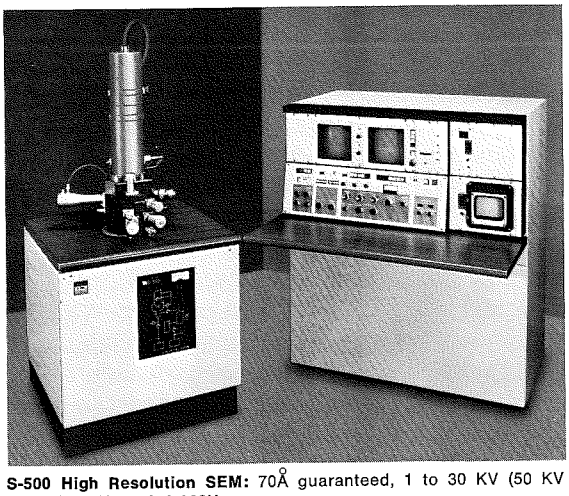

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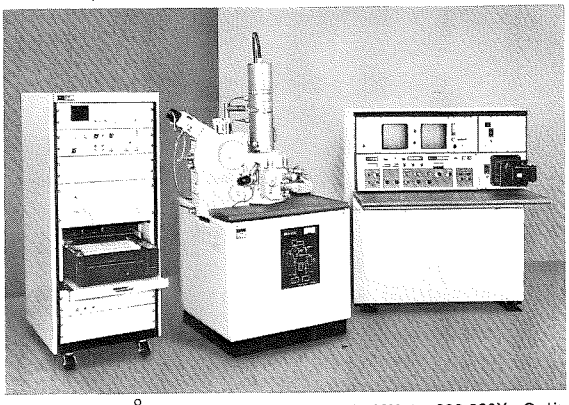

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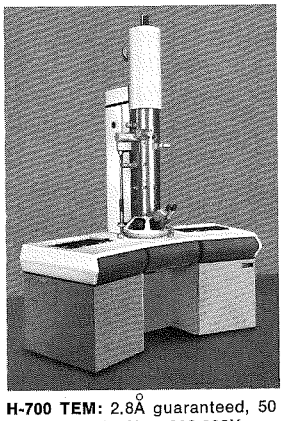

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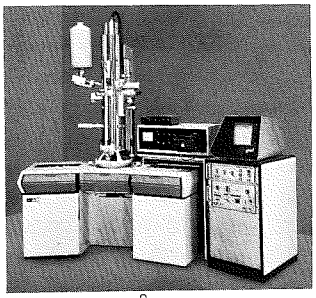
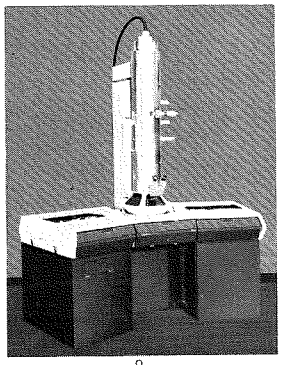
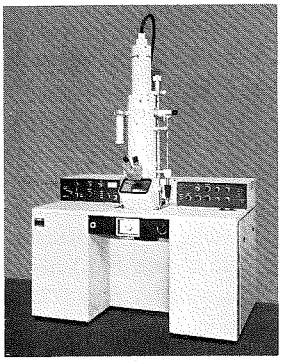


H-500 TEM: 1.4Å guaranteed, 10 to 125 KV, 100X to 800,000X.



H-550 TEM: 2.4Å guaranteed, 10 to 125 KV, 100X to 500,000X.



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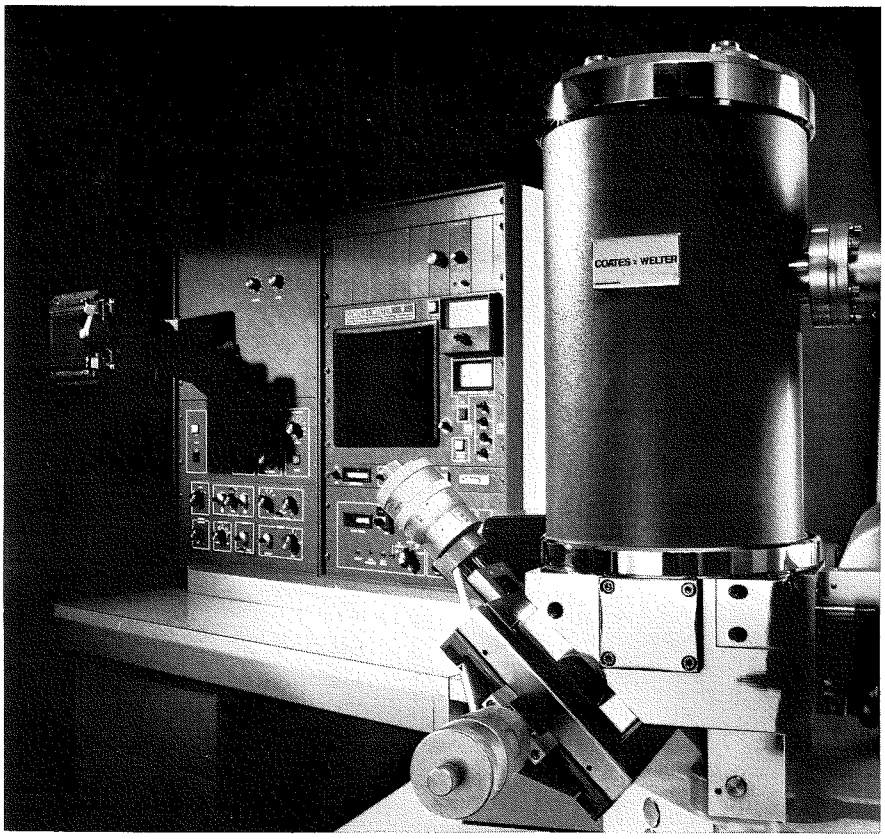

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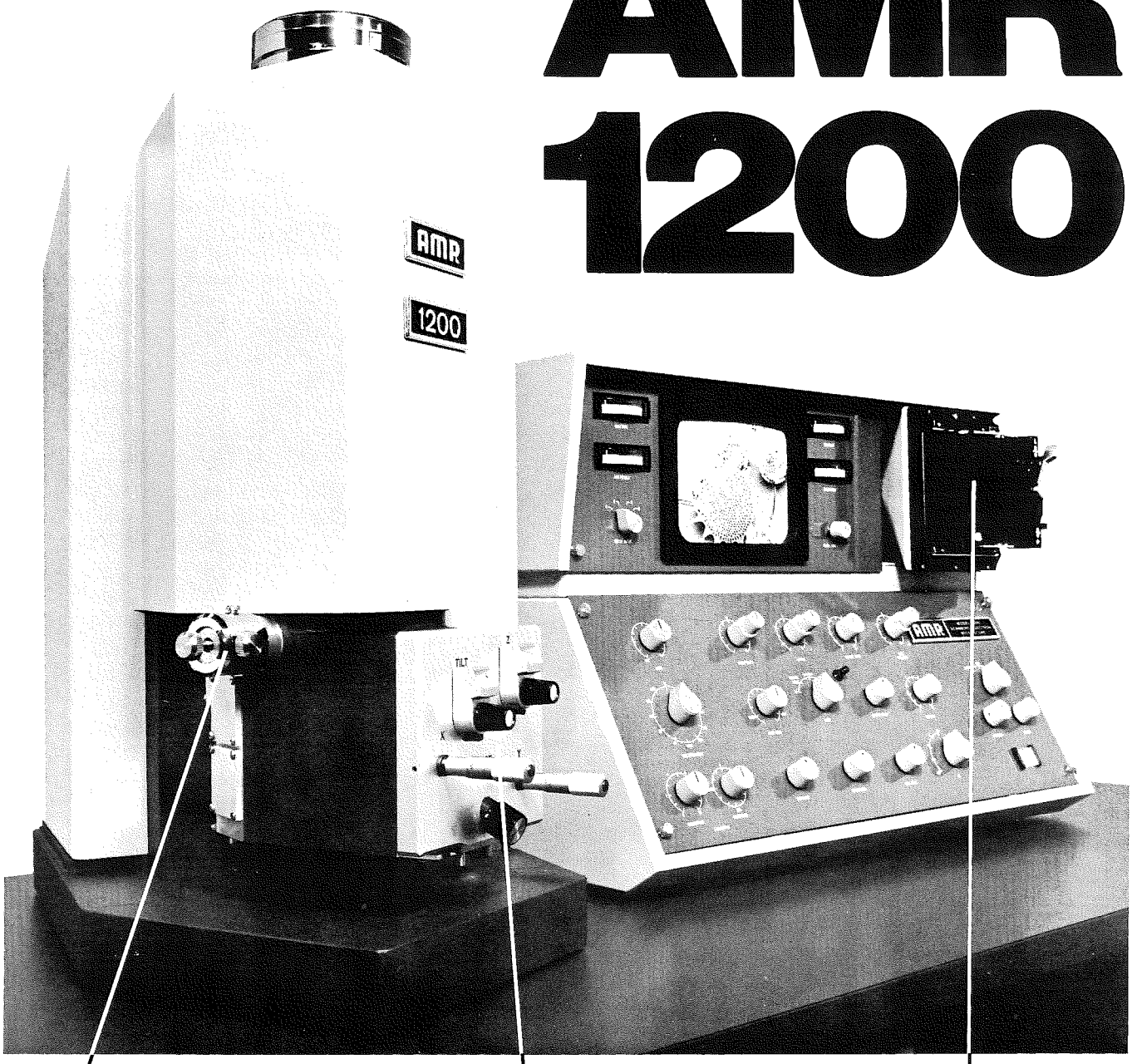

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Regional News

LOUISIANA: Louisiana Society for Electron Microscopy, Inc.

The officers and members of the Louisiana Society for Electron Microscopy take pleasure in announcing the Sixth Annual Joint Symposium of the Louisana and Texas Societies for Electron Microscopy and Twentieth Meeting of the Southeast Electron Microscopy Society, to be held concurrently in New Orleans during the dates of February 3-5, 1977. The site for these meetings will be the beautiful Monteleone Hotel located in the heart of the fabulous French Quarter. The decision by our colleagues from SEEMS to participate with us next year is certain to enhance the proven success and value of the Joint Symposium.

The Local Arrangements Committee anticipates a varied and interesting scientific program which will include platform presentations, poster sessions, EMSA micrograph exhibits, guest presentations and possibly technique demonstrations of special and timely interest by commercial representatives. In addition, SEEMS will present its annual Ruska Award for the best paper presented by a SEEMS student member, the Joint Symposium will award a plaque for the poster exhibit judged best by a panel of experts.

Fun will abound for all! In addition to the many attractions of New Orleans and the French Quarter, a hosted "beer and pretzel" welcome is planned for the first evening (Thursday) of the Symposium. A Social Hour will be held at the Monteleone Hotel on the second evening. A Symposium breakfast is planned for Saturday morning. Abundant tourist and chamber of commerce information will be available at the registration desk to aid you in sight seeing throughout New Orleans. A ladies hospital suite will be open during a portion of the meeting. Planned activities for wives may be arranged if sufficient and advanced interest is apparent.

A formal call for abstracts will be issued in September and abstracts will be due probably in December. Please keep these pertinent dates in mind and plan to be with us for the Sixth Joint Symposium and Twentieth SEEMS Meeting.

Members of the local arrangements committee include Co-Chairman Joe A. Mascorro (Tulane Medical School, 504-588-5255) and Robert F. Dyer (LSU Medical Center, 504-527-8132); Scientific Program, E. Raworth Allen and Tom Croley; Registration, Ines V. DeGruy and Gerry Carra; Scientific Exhibits/Poster Sessions, David W. Fredericksen; and Social Program, Peter M. Klara.

LUBBOCK: Texas Tech University School of Medicine, Department of Anatomy

Grants Awarded

Dr. John A. Yee — Cytodifferentiation of PDL Fibroblasts From National Institutes of Health — $10,000.00

Dr. Roger R. Markwald — Marcromolecular Ordering in Cardiogrnesis From American Heart Association, Texas Affiliate — $5,700.00. Dr. Markwald has also received a Career Development award from NIH on the role of extracellular matrix in cardiac morphogenesis.

Dr. Bernell K. Dalley — Cardiac Muscle Regeneration of the Rat Ventricle From American Heart Association, Texas Affiliate — $5,800.00

Dr. Patrick R. Sterrett — Contrast Materials and Blood-Brain Barrier From National Institutes of Health — $93,000.00

New Equipment

The Department of Anatomy has recently purchased an Hitachi HS 500 Scanning Electron Microscope, installed in September of this year.

The Department has also recently acquired additional laboratory space in the Old Student Health Building.

New Faculty

Dr. Donald L. Wilbur is leaving the department. Dr. Wilbur has accepted a position at Medical University of South Carolina in Charleston. He received his Ph.D. from M.U.S.C. in 1974, so is returning "home".

Dr. James Hutson has joined the faculty as Assistant Professor of Anatomy. Dr. Hutson received his graduate training at the University of Nebraska College of Medicine in Omaha. He brings with him special skills in techniques of electron microscopic immunocytochemistry and is currently working on the localization of FSH in the rat testis.

The Department accepted three new graduate students this fall. They are: James Rockenback, from Lubbock via Panhandle State University in Oklahoma; Vernon Liu from the University of Utah; Terry Wilkinson from Houston via Texas Tech University.

Publications

Yee, J. A., D. B. Kimmel, W. S. S. Jee. Peridontal Ligament Cell Kinetics Following Orthodontic Tooth Movement. *Cell and Tissue Kinetics*, 9:293 (1976).

Taylor, A. N., R. J. Lorenz, B. B. Turner, O. K. Ronnekleiv, R. L. Casady and B. J. Branch. Factors influencing pituitary-adrenal rhythmicity: its ontogeny and circadian variations in stress responsiveness. Psychoneuroendocrinology, 1:291-301 (1976).

Casady, R. L. and A. N. Taylor. Effect of electrical stimulation of the hippo-campus upon corticosteroid levels in the freely-behaving, non-stressed rat. Neuroendocrinology, 20:68-78 (1976).

Ledford, B. E., J. C. Rankin, R. R. Markwald and B. Baggett. Biochemical and Morphological changes following artificially stimulated decidualization in the mouse uterus. Biology of Reproduction (1976) (In press — November).

Markwald, R. R., J. P. Fitzharris and F. J. Manasek. Cardiac cushion development. American Journal of Anatomy (1976) (In press).

Lectures

Dave Bernanke attended the W. J. Alton-Jones Cell Science Center at Lake Placid, New York for a symposium on primary cell culture.

GALVESTON:

Grants Awarded

Cell Cycle and Response of Tumor Cells to Chemotherapy — National Cancer Institute — 1975-1978

Studies of the Morphological and Cytochemical Manifestations of the Chang Rat Hepatoma Cells under Altered Growing Environments — Oncology Associates — 1976-1977

Lectures

Dr. Chang is currently in the Orient lecturing in Tokyo and Honk Kong and attending meetings of the Academic Sinica, Republic of China (Taiwan).

Publications

Lin, Chin-Tarng and Jeffrey P. Chang. Electron Microscopy of Albumin Synthesis. Science, 190:465-467, 1975

Abstracts in the Journal of Histochemistry and Cytochemistry, Federation Proceedings, and the Proceedings of the International Congress of Cell Biology. (1976)

New Faculty and/or Staff Members

Peter C. Moller, Ph.D. Research Scientist

SAN ANTONIO: Southwest Research Institute, Department of Materials Sciences

Publications, not previously reported, which involve use of various techniques in the Scanning Electron Microscope at SwRI are:

"Scanning Electron Microscopy of the Integumental Surfaces of *Schistosoma haematobium*" by Robert E. Kuntz, George S. Tulloch, David L. Davidson, and Tao-cheng Huang, *Journal of Parasitology* 62 63-69 (1976).

"Fatigue Crack Tip Plasticity Associated with Overloads and Subsequent Cycling," by J. Lankford and D. L. Davidson, *Journal of Engineering Materials and Technology* (ASME), *98* (1), Series H, 17-23 (1976).

"Plastic Strain Distribution at the Tips of Propagating Fatigue Cracks," by D. L. Davidson and J. Lankford, *Journal of Engineering Materials and Technology* (ASME), *98* (1), Series H, 24-29 (1976).

"Fatigue Crack Tip Plastic Zone Size and Shape Through the Specimen Thickness," by D. L. Davidson, *International Journal of Fracture* (Reports of Current Research), 11, 1047-1048 (1975).

"Rotation Between SEM Micrograph and Electron Channeling Patterns," by D. L. Davidson, *Journal of Physics E*, 9 341 (1976).

Other news: SwRI is constructing an electrohydraulic, 1000-lb capacity cyclic loading stage to fit within our SEM for studies in deformation, fracture, and fatigue crack initiation and propagation.

SAN ANTONIO: University of Texas Health Science Center, Department of Anatomy.

Grants Awarded

Dr. John T. Hansen — "Morhogenesis of the Rabbit Aortic Glomera" American Heart Association - Texas Affiliate

Publications

Reiter, R. J., Welsh, M. G. and Vaughn, M. K. (1976) Age-related changes in the intact and sympathetically denervated gerbil pineal gland. Amer. J. Anat. 146:427-432.

Arimura, A., M. Shiino, K. G. DeLa Cruz, E. G. Rennels and A. V. Schally 1976 Effect of Active and Passive Immunization with Luteinizing Hormone-Releasing Hormone on Serum Luteinizing Hormone and Follicle-Stimulating Hormone levels and the ultrastructure of the Pituitary Gonadotrophs in castrated male rats. Endocrinology 99, 291-303.

Herbert, D. C. 1976 Immunocytochemical evidence that Luteinizing Hormone (LH) and Follicle Stimulating Hormone (FSH) are present in the same Pituitary Cell Type in the Ruesus Monkey. Endocrinology 98, 1554-1557

New Faculty and/or Staff Members

Dr. Alberto J. Carrillo — Assistant Professor of research & Neuroology from UCLA

Dr. Curtis J. Gravis — Instructor research: EM of testis from Tulane University

Dr. T. B. "Rusty" Pool — Post Doctoral fellow with Dr. Ivan Cameron. Took PLD from W. Virginia in Biology, former graduate of Sam Houston State University. Working in area of chromatin structure

Presented at the EMSA meeting in Miami Beach, Aug. 1976

M. L. Welsh and R. J. Reiter. The ultrastructure of the gerbil pinial gland under normal and experimental conditions.

Presented at the Endocrine Society meeting in San Francisco, June 1976

Herbert, D. C. and Rennels, E. G. 1976 Effect of Testosterone on Serum and Pituitary Procactin in Juvenile Male Rhesus Monkeys. Program of 58th Annual Meeting of the Endocrine Society, P. 115.

AUSTIN: University of Texas, Department of Zoology

Elsie Sorensen has accepted a postdoctoral position at the Division of Biological and Medical Research at the Argonne National Laboratories in Argonne, Illinois.

Papers and Presentations:

Elsie Sorensen. Thermal effects on the accumulation of arsenic in green sunfish, *Lepomis cyanellus (R)*, exposed to solutions of sodium arsenate. Journal of Fish Biology, 8:229-240, 1976.

Mortality and total body burdens of arsenic in sunfish following acute experimental exposures. Abstract in the Program of the Fifty-Sixth Annual Meeting of the American Society of Ichthyologists and Herpetologists at Fairbanks, Alaska, 7-11 June 1976.

Gaseous and solid effluents. Presented at the symposium on Electric Power and the Environment at Austin, Texas, 11 June and 15 July, 1976.

Cell Research Institute and Department of Zoology

T. H. Hamilton, J. Skipper and R. Ramirez-Mitchell, Estrogen action in the male *Xenopus* liver. Presented in the Department of Cell Biology, Baylor College of Medicine, May 21, 1976.

Cell Research Institute

New Members: Dr. Susan Fullilove from the University of Nebraska at Omaha is working under a training grant from NIH/NCI.

HOUSTON: Baylor College of Medicine, Departments of Neurology and Pathology

Lectures:

Dr. Ronald F. Dodson presented a lecture on March 23, 1976 entitled: "The use of animal models in the study of cerebrovascular disease in man" to the Sigmi Xi Society of Lamar University, Beaumont.

Lena Wai-Fong Chu presented a paper co-authored by Drs. Dodson and Patten entitled: "Ultrastructural Change in Muscle Biopsy from a case of Progressive Ophthalmoplegia" at the E.M.S.A. meeting in Miami Beach.

Dr. Dodson also presented a paper entitled: "The Effects of Intracarotid Injections of Reserpine on Cerebral Tissue" at the same meeting.

Recent Publications from Dr. Dodson's lab include:

Patten, B. M., Dodson, R. F., Hoffman, P., and Howell, R: Mitochondrial myopathy associated with abnormal lactate metabolism: Response to prednisone in three patients. Neurology 26:370, 1976.

Dodson, R. F., Aoyagi, M., and Chu, L. W-F: Ultrastructural changes in subacute cerebral infarction following Middle Cerebral Artery occlusion in baboon. Cytobios, *13*, 97-108, 1975.

HOUSTON: University of Texas Health Science Center, Neurobiology and Anatomy.

Dr. Dianna A. Redburn has been awarded a grant by the National Institute of Health for work concerning "Identification of Transmitter Agents in Retina."

The Department of Neurobiology and Anatomy was represented at the Electron Microscopy Society of America meeting in Miami by Dr. Joe G. Wood and by Margaret Bell, graduate student in the lab of Dr. Richard Peterson. Margaret was a winner of an EMSA Presidential Scholarship for her work on "The Effects of Colchicine on Tubules and Microtubules."

Dr. Richard G. Peterson has recently presented a series of seminars and participated in discussion sessions concerning "The Toxicology and Pharmacology of Abused Inhalants" at the National Institute of Drug Abuse in Washington, D.C. Dr. Peterson has also presented his work on "Localization of PNS Myelin Proteins" at Commonwealth University in Richmond, Virginia.

Dr. Sam Enna has joined the Department of Neurobiology

and Anatomy. Dr. Enna comes to the Department from a Post-Doctoral position at N.I.H.

New editions to the technical staff include: Greg Fuller, in the lab of Dr. Richard Wiggins, Tony Scott, and Diana Weihs in the lab of Dr. Peterson.

HOUSTON: Anderson Hospital and Tumor Institute, Virology Department

Grants Awarded

An institutional grant entitled "Studies on Viral Nucleotide Sequences Involved in Neoplastic Transformation" was approved for funding by the Institutional Research Grant Committee. Dr. John E. Knesek is the Principal Investigator of this grant.

An institutional research grant has been awarded to Drs. J. M. Bowen and Doug Hixson, Investigators, for their project entitled, "Studies on Lectin-Binding Properties of Mouse Mammary Tumor Virus".

The Department of Virology has received a $24,000 supplement to NO1 CP 43370, Immunological Studies on Human Breast Carcinoma. Dr. J. M. Bowen is principal Investigator of this contract.

Lectures

Dr. Leon Dmochowski attended the Xth Meeting on Mammary Cancer in Experimental Animals and Man in Kobe, Japan, March 29-31, 1976, and presented a paper entitled "Humoral Immunity in Mouse and Human Breast Cancer" in the 10th Session on March 31. Dr. Dmochowski was Chairman of the 5th Session of the Symposium on March 30, and presented Concluding Remarks at the end of the meeting. Dr. Dmochowski visited the Aichi Cancer Research Institute in Nagoya, Japan, with Dr. M. Hoshino and presented a paper entitled "Viruses and Breast Cancer in Animals and Man" on April 1, 1976. He also visited with Dr. Yohei Ito, Chairman, Department of Microbiology, Kyoto University School of Medicine and presented a lecture entitled, "Viruses and Neoplasia in Animals and Man" on April 2, 1976. Dr. Dmochowski visited the Institite of Radiology and Oncology at the Queen Elizabeth Hospital in Kowloon, Hong Kong, and presented a discussion on the "Relationship of RNA and DNA Viruses to Human Neoplasia".

Between April 26 and May 1, 1976, Dr. Leon Dmochowski attended the Third International Symposium on Detection and Prevention of Cancer in New York City. He chaired a session on "Virus and Experimental Oncogenesis" and presented a paper on "Relevant Results of Experimental Oncology for Detection and Prevention of Cancer" at a session on Bridging Experimental and Clinical Oncology.

Dr. Bowen presented the position paper on research at M. D. Anderson Hospital Symposium "The Mission of the University of Texas System: Directions for the Future" on April 12, 1976.

On April 15, 1976, Dr. J. M. Bowen presented a lecture entitled "Viruses and Cancer: The Basic Scientist in a Categorical Institute" to the Houston Philosophical Society.

Several members of our department attended the 76th Annual Meeting of the American Society of Microbiology held in Atlantic City, New Jersey, May 1-7, 1976, and Dr. James Chan presented a paper entitled, "Phenotypic Mixing Between Vesicular Virus". Another paper entitled "Sarcoma-Negative Leukemia-Positive Transformed Cells Isolated from MSV-Induced Rat Bone Tumors" was presented by Dr. Chan's tutorial student, Ms. Cynthia Tifft at this meeting.

Several members from our department attended the Annual Meeting of the American Association for Cancer Research in Toronto, Ontario, Canada, May 5-9, 1976, and presented several papers.

Dr. James East presented a talk May 25, 1976, to the Leukemia-Lymphoma Study Section of our institution entitled, "Search for Virus-Related Information in Human Neoplasia" which deals with research being done in his laboratory on the detection in human neoplastic cells of nucleotide sequences that are related to those of RNA genomes of mammalian RNA tumor viruses.

Dr. L. Dmochowski attended the National Prostatic Cancer Workshop in Bethesda, Maryland, June 28-29, 1976, and presented a paper entitled, "Search for Oncogenic Viruses in Human Prostate".

On June 9, 1976, Dr. J. M. Bowen spoke to a meeting of the faculties of various schools of nursing, sponsored by the Department of Nursing. The title of Dr. Bowen's lecture was, "Cancer and Viruses". On June 11 Dr. Bowen again spoke to the same group on "Grants and Trends in Cancer Research".

Dr. Bowen presented five lectures in the Nurses Special Program in Oncology: "Viruses and Cancer — Recent Findings": On January 28 to Group I and on February 18, 1976, to Group 2; "Human Experimentation — Surveillance and Informed Consent" on February 18 to Group 2; "Virus Research in a Cancer Institute" (informal discussion and tour of facilities) on February 9 to Group 1 and on February 23 to Group 2. Dr. Bowen presented a lecture, "Viral Immunology and Immunodiagnosis — Techniques and Concepts", in the Medical Technology Program (arranged through the Department of Laboratory Medicine) on February 19. Dr. Bowen presented a lecture "Papovaviruses — Replication and Transformation" on February 23 to the GSBS Virology Course students.

Publications

The following papers were published in COMPARATIVE LEUKEMIA RESEARCH 1975. BIBLIOTHECA HAEMATOLOGICA, No. 43 (Proceedings on VIIth International Symposium of Comparative Research on Leukemia and Related Diseases, Copenhagen, Denmark, October 13-17, 1975):

Dmochowski, L., J. M. Bowen, B. Myers, E. S. Priori, M.F. Miller, G. Seman, J.C. Chan, M.L. Dodson, M. Scanlon, Y. Ohtsuki, and H. Yoshida. "Comparative studies of type C, type B, and M-PM oncornaviruses", pp. 417-424, 1976.

East, J.L., J. E. Knesek, J. C. Chan, K. Maruyama, E.S. Priori, and L. Dmochowski. "Sequence relatedness of mammalian viral RNA genomes and RNA species released by human neoplastic cells", pp. 484-487, 1976.

Maruyama, K., M.F. Miller, D.C. Hixson, and S.H. Wagner. "Surface properties of mammalian C-type viruses"

Priori, E.S., K.V. Ilyin, L. Dmochowski, and D.L. Fine. "Immunological relationship between an oncornavirus isolate from HEp-2 cells, Mason-Pfizer monkey virus, and human tumor cells", pp. 488-490, 1976.

Bowen, J.M., L. Dmochowski, M.F. Miller, E.S. Priori, G. Seman, M.L. Dodson, and K. Maruyama. "Implications of humoral antibody in mice and humans to breast tumor and mouse mammary tumor virus-associated antigens". CANCER RESEARCH 36 (Pt. 2): 759-764, Feb., 1976.

Dmochowski, Leon. "Viral type A and type B hepatitis. Morphology, biology, immunology, and epidemiology. A review". AM. J. CLIN. PATH 65(5): 741-786, 1976.

Seman, G. and L. Dmochowski. "Methods for electron microscopy of viruses" METHODS IN CANCER RESEARCH, Chptr. 4, Vol. XII, Academic Press, 1975, pp. 177-255.

The following abstracts were published in the Proceedings of the American Association for Cancer Res., Toronto, Canada, May 6-8, 1976:

Bowen, J.M., L. Dmochowski, G. Seman, M. Scanlon, and B. Jackson. "Antiviral and antitumor antibodies in mouse and human breast cancer", p. 58, 1976. Abstract #229.

Ohtsuki, Y., G. Seman, J.M. Bowen, and L. Dmochowski. "Intracisternal virus particles in SD-MS (rat bone tumor) virus-infected mouse prostate cells grown *in vitro*," p. 110, 1976. Abstract #440.

Seman, H., J.M. Bowen, and L. Dmochowski. "Histological

study of iron deposits in mammary glands of mice", p. 110, 1976. Abstract #439.

Wiseman, C. J.M. Bowen, G. Blumenschein, E. Hersh, B. Jackson, and M. Sullivan. "A family study of reactivity to viral and mammary tumor-associated antigens", p. 191, 1976. Abstract #761.

Dmochowski, L., J. Georgiades, J. M. Bowen. "Transforming factors in human sarcoma cells in tissue CULTURE". J. CLINICAL ORTHOPEDICS, 117:327-343, 1976.

Dmochowski, L. and J. S. Horoszewicz. 'Viral oncology of prostatic cancer". SEMINARS IN ONCOLOGY 3(2):141-150, 1976.

Ohtsuki, Y., G. Seman, K. Maruyama, J. M. Bowen, D. E. Johnson, and L. Dmochowski. "Ultrastructural studies of human prostatic neoplasia". CANCER 37 (5):2295-2305, 1976.

Seman, G., S. J. Hunter, R. D. Miller, and L. Dmochowski. "Characterization of an established cell line (SH-3) derived from pleural effusion of patient with breast cancer". CANCER 37(4):1814-1824, 1976.

Dmochowski, L.: "Morphological, biological, immunological, and biochemical studies on bone tumors of animals and man". Proceedings of VIth Int. Symp. of Malignant Bone Tumors in Animals and in Man, Duseldorf, Germany, October 17-18, 1974. In RECENT RESULTS IN CANCER RESEARCH, edited by E. Grundman, Springer-Verlag, Berlin-Heidelberg, Vol. 54, pp. 168-184, 1976.

Seman, G., and L. Dmochowski. "Methods for electron microscopy of viruses". In CANCER RESEARCH, Vol. XII, Chapter 4. Edited by H. Busch. Academic Press, New York, pp. 177-255, 1976.

Maruyama, K. and L. Dmochowski. "Surface antigens of RNA virus-induced tumors". Proceedings of 26th Symposium on Fundamental Cancer Research. In IMMUNOLOGICAL ASPECTS OF NEOPLASIA, 1975, pp. 169-189.

New Faculty and/or Staff Members

On July 1, 1976, Dr. Helena Strandstrom from Helsinki, Finland, joined the Department of Virology as Project Investigator. Dr. Strandstrom has spent more than a year as a Fulbright Fellow at Roswell Park Memorial Institute, where she was involved in the study of oncogenic effects of human tumor extracts and contributed to studies in defining the tumor capacity of Yaba virus and attempting to grow this subprimate virus in eggs.

COLLEGE STATION: Texas A&M

Grants Awarded

Art Sowers received a 1976 EMSA Presidential Scholarship for his paper entitled "Living Plants Continue to Grow after Examination by Scanning Electron Microscopy". He presented the paper at EMSA 1976 on August 11, 1976 in Miami Beach, Florida.

Lectures

Dr. E. Laurence Thurston presented a short program in scanning electron microscopy at Woods Hole Institute of Oceanography on July 5-9, 1976. Also participating was Dr. Keith Porter from the University of Colorado.

Publications

Thurston, E. L. 1976. Morphology, fine structure and ontogeny of the stinging emergence of *Tragia ramosa*. Am. J. Bot. (in press).

Mims, C. W., E. L. Thurston and F. Seabury. 1976. An ultrastructural study of spermatium formation in the rust fungus *Gymnosporangium juniperi-virginianae*. Am. J. Bot. (in press).

Thurston, E. L. 1976. Secretory Structures (Plant). McGraw-Hill Yearbook of Science and Technology.

Ingram, L. O. and E. L. Thurston. 1976. Potassium requirement for cell division in *Anacystis nidulans*. J. Bact. 125: 369-371.

Pettit, R. E., R. A. Taber, P. J. Ives, E. L. Thurston, O. Smith and T. E. Boswell. 1976. Peanut Pods: Structural Differences Among Cultivars as Revealed by Scanning Electron Microscopy. Proc. 9th IITRI SEM Symposium. 1976. 506-512.

New Faculty and/or Staff Members

Dr. Peter Rizzo has joined the Department of Biology at Texas A&M University. He received a PhD from the University of Michigan. Dr. Rizzo's research interests include chromosomal proteins and hormones and their role in development.

TEMPLE: Scott & White Clinic, Department of Tissue Culture and Virology

Recent Publications

Leibovitz, A., Stinson, J. C., McCombs, W. B. III, McCoy, C. E., Mazur, K. C., and Mabry, N. D.: Classification of human colorectal adenocarcinoma cell lines. *Cancer Research*, In press.

McCombs, W. B. III, Leibovitz, A., McCoy, C. E., Stinson, J. C., and Berlin, J. D.: Morphologic and immunologic studies of a human colon tumor cell line (SW-48). *Cancer*, In press.

Grants

Albert Leibovitz, Genetic Determination of Tumor Antigen and Tumorigenicity of Human Colorectal Cell Lines. Scott, Sherwood, and Brindley Foundation.

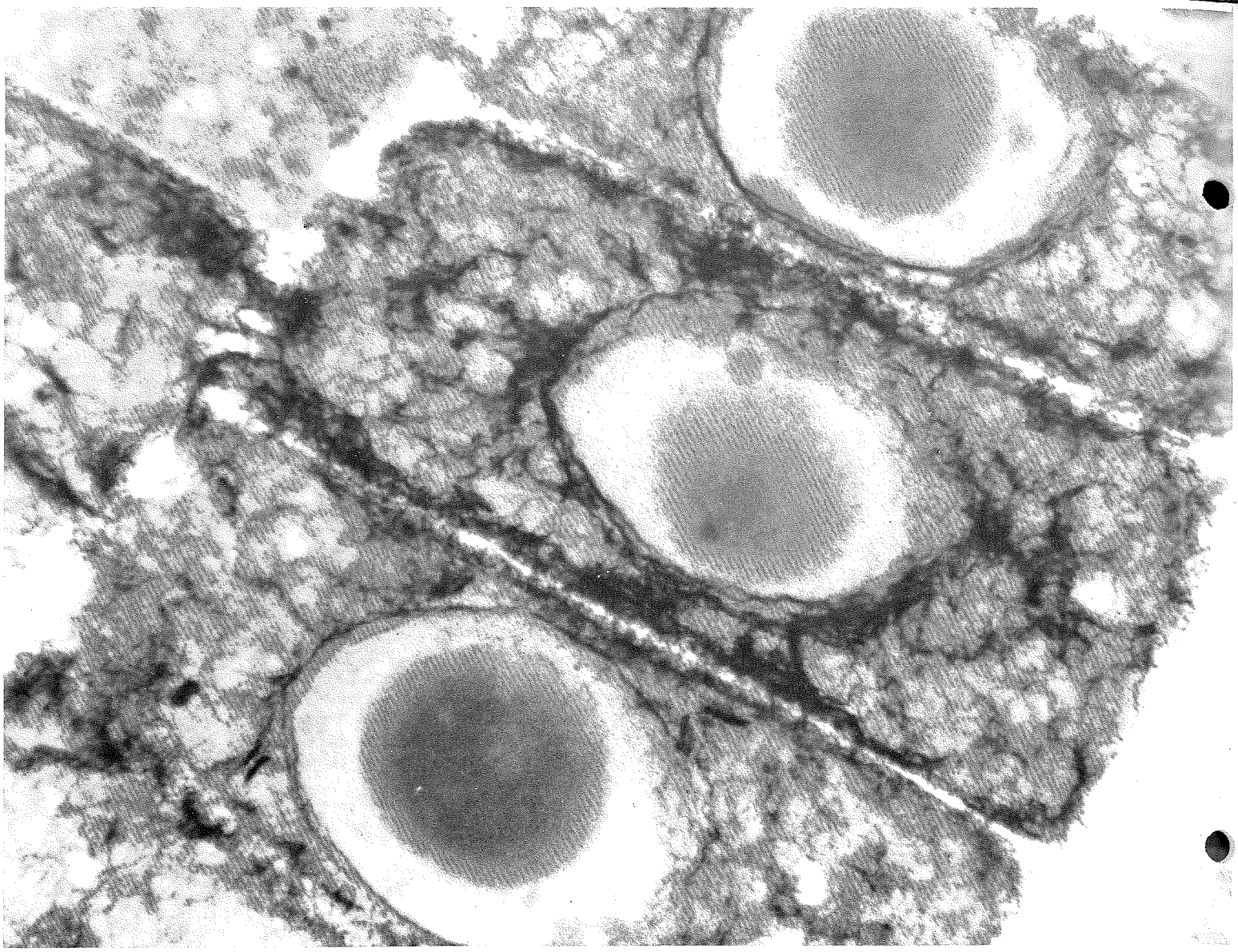
Dr. William B. McCombs, The Production of Antiserum to Carcinoembryonic Antigen in Immunotolerant Animals. Scott, Sherwood, and Brindley Foundation.

Displays

Dr. McCombs presented a poster display at the EMSA meeting in Miami entitled "New Human Tumor Cell Lines".

Department of Pathology

Dr. Joe Wood, chairman of Neuroanatomy at University of Texas Medical School at Houston, was a visiting lecturer in the Department of Surgical Pathology on July 23rd.



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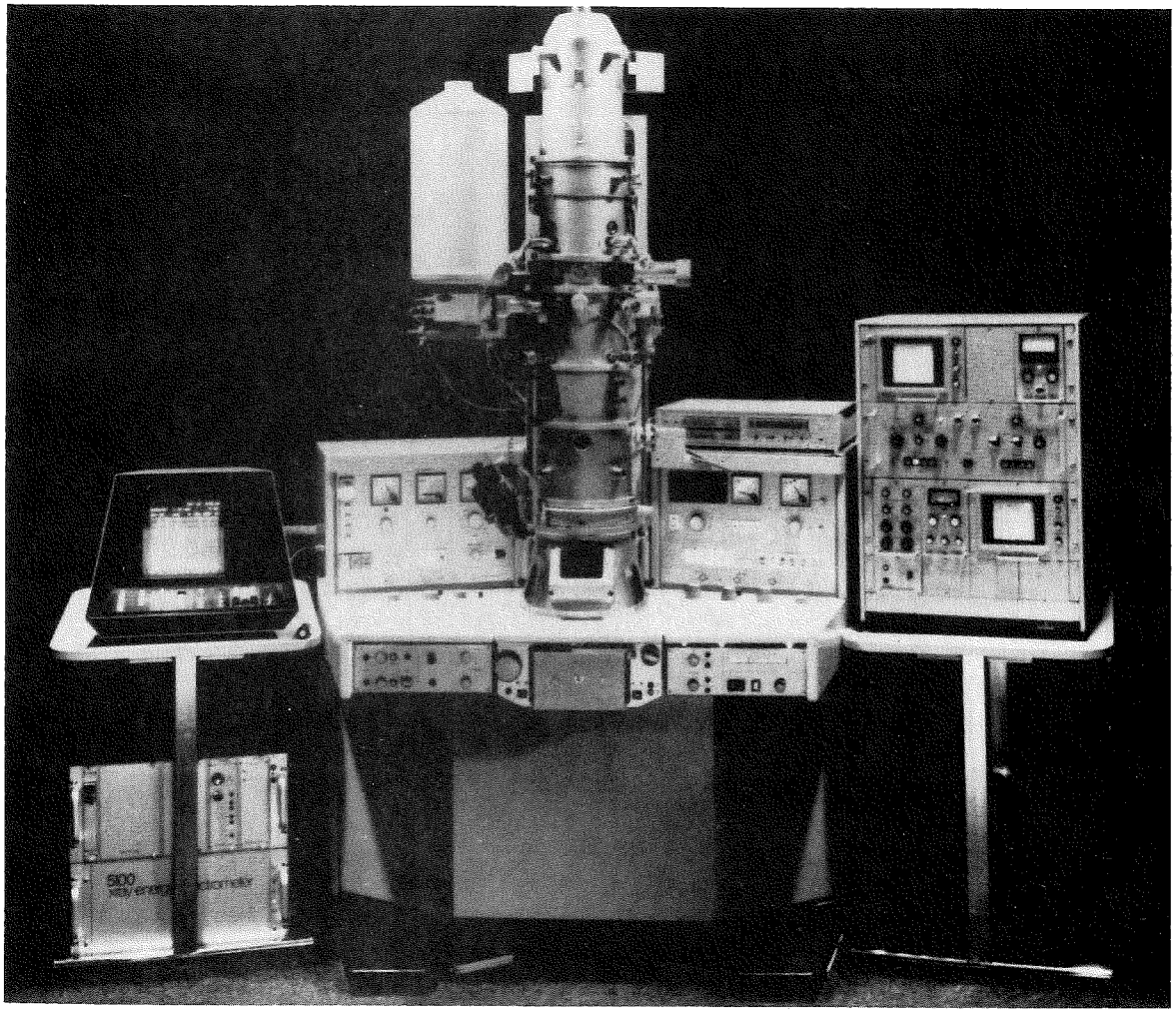
The Elmiskop 102 offers the state of the art in Transmission (TEM) – Scanning Transmission (STEM) – Scanning (SEM) and Energy Dispersive Analysis.



For further information and a demonstration, please call Dietrich Voss at (713) 661–3601, Siemens, 11506 South Main St., Houston, Texas 77025