THE SOCIETY FOR INVESTIGATIVE DERMATOLOGY, INC.

McCORMICK PLACE
CHICAGO, ILLINOIS

Sunday Morning and Afternoon, June 26th
Monday and Tuesday Mornings, June 27th and 28th
1966

Program

TWENTY-SEVENTH ANNUAL MEETING

OF

THE SOCIETY FOR INVESTIGATIVE DERMATOLOGY, INC.

McCORMICK PLACE
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1966

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The Society For Investigative Dermatology

Year	President	Year	President
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1939	J. V. Klauder	1954	A. C. Curtis
1940	J. H. Stokes	1955	C. S. Livingood
1941	J. B. Shelmire	1956	J. L. Callaway
1942	F. Wise	1957	M. E. Obermayer
1944	F. D. Weidman	1958	W. C. Lobitz, Jr.
1946	H. E. Michelson	1959	H. K. B. Pinkus
1947	H. Beerman	1960	T. B. Fitzpatrick
1948	S. W. Becker, Sr.	1961	H. Blank
1949	S. Rothman	1962	W. B. Shelley
1950	D. M. Pillsbury	1963	H. Mescon
1951	M. B. Sulzberger	1964	R. L. Baer
1952	S. M. Peck	1965	I. Blank

PLEASE BRING THIS FINAL PROGRAM WITH YOU TO THE MEETING

The papers presented at this meeting are the property of *The Society for Investigative Dermatology*, and will be submitted to *The Journal of Investigative Dermatology*. The manuscripts must be handed in to the Secretary, Dr. George W. Hambrick, Jr., either before or at the time of the reading of the papers.

All papers are limited to ten minutes.

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THE SOCIETY FOR INVESTIGATIVE DERMATOLOGY, INC.

The 27th Annual Meeting of THE SOCIETY FOR INVESTIGATIVE DERMATOLOGY will be held at McCormick Place, Chicago, Ill., all day Sunday, June 26th and on Monday and Tuesday mornings, June 27th and 28th, 1966.

The scientific sessions of the AMERICAN MEDICAL ASSOCIATION SECTION ON DERMATOLOGY will be on Monday and Tuesday afternoons June 27th, 28th and Wednesday all day, June 29th, 1966, at McCormick Place.

Reservations for rooms should be made AT ONCE on the enclosed form, through the Housing Bureau of the American Medical Association. Please put Conrad-Hilton Hotel first and five other choices.

Our program contains an abundance of interesting and practical material. We are pleased to announce that Jerome Gross, M.D., Chief of The Biology Laboratory, Massachusetts General Hospital, Harvard Medical School, will give the Sixth Annual Herman Beerman Lecture on Tuesday, June 28th, at 9:00 A.M. His subject will be: How The Tadpole Loses Its Tail.

The Annual Cocktail Party and Dinner is scheduled for 7:00 P.M., Monday, June 27th at the Conrad-Hilton Hotel. Dr. Andrew Lorincz, Gainsville, Fla., will be the speaker. Please return the enclosed reservation coupon with your check BEFORE JUNE 1st.

We thank all who have cooperated in arranging this meeting.

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COMMITTEE ON ARRANGEMENTS

THE SOCIETY FOR INVESTIGATIVE DERMATOLOGY, INC.

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THE JOURNAL OF INVESTIGATIVE DERMATOLOGY
(Official Organ of The Society for Investigative Dermatology)
NAOMI M. KANOF, M.D., Editor

THE SOCIETY
for
INVESTIGATIVE DERMATOLOGY, INC.

Sunday, June 26, 1966 McCormick Place

MORNING SESSION

8:30 A.M. BUSINESS AND EXECUTIVE SESSION

1. Reading of Minutes
2. Reports of
   Directors, Treasurer, Nominating Committee, Committee on Membership, Committee on Publications, etc.
3. Nominations from the Floor

SCIENTIFIC SESSION

1. **PRESIDENTIAL ADDRESS: INTEGUMENT—THE HIDE IN SEEKING.** EUGENE J. VAN SCOTT, M.D., National Cancer Institute, National Institutes of Health, Bethesda, Maryland.

2. **PREPARATION AND CHARACTERIZATION OF A VIABLE SUSPENSION OF POSTEMBRYONIC HUMAN EPIDERMAL CELLS.** ROBERT A. BRIGGAMAN, M.D., DONALD C. ABELE, M.D., and CLAYTON E. WHEELER, JR., M.D., Division of Dermatology, Department of Medicine, University of North Carolina School of Medicine, Chapel Hill, North Carolina.

   A method for preparing viable human epidermal cell suspensions is described, along with the requirements and possible usefulness of such a system. Primary *ex vivo* preparation of an epidermal cell suspension is achieved by tryptic separation of epidermis, followed by the mechanical removal of the epidermal cells from the whole separated epidermis. The cells are dissociated by further trypsinization to an essentially single cell suspension. Viability of the cells is demonstrated in culture by aggregation of cells, attachment to glass, and outgrowth of cells forming monolayer sheets on glass. The system has been shown to be essentially free of dermal cells. Epithelial cells and melanocytes have been tentatively identified in culture. Measurements of total cell numbers and cell viability have been accomplished.

3. ***IN VITRO* CULTURE OF HUMAN SKIN EPITHELIAL CELLS.** MARVIN A. KARASEK, Ph.D., Department of Dermatology, Stanford University School of Medicine, Palo Alto, California.

   Growth of infant and adult human skin epithelial cells from explants of full-thickness, and split-thickness skin has been studied *in vitro*. Human skin epithelial cells, in contrast to other cell types in skin (fibroblasts) multiply in a unique manner and synthesize proteins with keratin-like properties. Agents that affect growth and keratinization of epithelial cells *in vivo* (Vitamin A, arsenate, and seleno-compounds) also affect growth and keratinization *in vitro*.

   The presence of dermis markedly influences the multiplication of epithelial cells, and the role of the dermis in the control of epithelial cell growth and differentiation *in vitro* will be discussed.

4. **OBSERVATIONS ON KERATINIZATION OF HUMAN SKIN *IN VITRO*.** GEORGE W. HAMBRICK, JR., M.D., STANFORD I. LAMBERG, M.D., and ROSALYN BLOOMBERG, B.S., Department of Dermatology, School of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.

With a modified Trowell technic for organ culture, human adult skin and fetal skin have been maintained for several weeks *in vitro*. In these cultures keratinization does not follow the normal *in vivo* pattern. The granular layer disappears and the final product of the epidermis is a dead, nucleated cell, different from normal horny cells.With the addition of heparin to the media under controlled conditions, a horny layer develops without parakeratosis. Similar experiments with other additives, such as mucopolysaccharides or their components, will be reported. The possible mechanisms will be discussed.

5. **KERATOHYALIN GRANULES AND HISTIDINE.** ALVIN J. COX, M.D., and EVE P. REAVEN, Ph.D., Department of Dermatology, Stanford University School of Medicine, Palo Alto, California.

Tritium-labelled histidine injected intraperitoneally was traced electron microscopically in the epidermis of newborn mice by means of radioautographs prepared from specimens removed at successive time intervals. At 2 hours the labelled histidine was concentrated in the stratum granulosum, where it was bound largely in the regions occupied by keratohyalin granules. Over the next 7 days the zone of maximal concentration of bound histidine was found in progressively more superficial parts of the stratum corneum. Histidine was bound to keratohyalin granules at all stages of their evolution, suggesting that this amino acid has a functional relationship to the granules rather than a purely structural significance.

6. **EPIDERMAL KERATINIZATION: LOCALIZATION OF ISOTOPICALLY LABELED AMINO ACIDS.** KIMIE FUKUYAMA, M.D., and WILLIAM L. EPSTEIN, M.D., Division of Dermatology, University of California, San Francisco Medical Center, San Francisco, California.

This report concerns the differential pattern of incorporation of 15 isotopically labeled amino acids in the epidermis of newborn rats. Autoradiographic study was performed sequentially after intraperitoneal injection of labeled compounds. At least three patterns of initial labeling were seen: 1) localization in the upper layers, 2) concentration primarily in lower layers, and 3) labeling in both areas equally. Variations were also noted in intracellular localization of labels and their movement into the cornified layer. The findings will be compared to similar studies in man and will be discussed in terms of their relationship to keratinization.

7. **ICHTHYOSIFORM DERMATOSES II. AUTORADIOGRAPHIC STUDIES OF EPIDERMAL PROLIFERATION.** PHILLIP FROST, M.D., GERALD D. WEINSTEIN, M.D. and EUGENE J. VAN SCOTT, M.D., Department of Dermatology, University of Miami School of Medicine, Miami, Florida, (Drs. Frost and Weinstein); Dermatology Branch, National Cancer Institute, National Institutes of Health, Bethesda, Maryland (Dr. Van Scott).

Hyper-proliferation, as indicated by increased mitotic activity has been noted in certain ichthyosiform dermatoses by Frost and Van Scott. The present paper presents additional information obtained

with autoradiographic techniques on the epidermal kinetics of *two* of the four dermatoses previously characterized (ichthyosis vulgaris and verrucous ichthyosis). The number of labeled (thymidine-^{3}H) epidermal cells per unit skin surface in these conditions was greatly increased compared to normal. In addition, the transit of newly formed epidermal cells through the stratum malpighii was two to three times more rapid than normal. These data offer further evidence that epidermal hyperplasia plays some role in the pathophysiology of these forms of ichthyosis.

8. **CORRELATION OF TISSUE MUCOPOLYSACCHARIDES WITH THE HAIR CYCLE.** GIUSEPPE MORETTI, M.D., CARLA CIPRIANI, D. CHEM, ALFREDO REBORA, M.D., ENRICO RAMPINI, M.D., and FRANCO CROVATO, M.D., Dermatologic Clinic, Medical School, University of Genoa, Genoa, Italy.

Following previous studies of mast-cells, histamine and serotonin in provoked hair-cycles, the authors have applied the technique of Schiller to the skin of rats in order to ascertain the content of heparin, hyaluronic and chondroitin sulphuric acids and total mucopolysaccharides during those cycles. In these experiments the above substances have shown considerable quantitative fluctuations apparently related to the different stages of the observed cycles. The curves of values thus obtained were roughly similar to those of histamine and mast-cells. A correlation with the mast-cell population could thus be inferred.

AFTERNOON SESSION

1:30 P.M. SCIENTIFIC SESSION

1. **PURINE AND PYRIMIDINE METABOLISM IN HUMAN EPIDERMIS.** J. DE BERSAQUES, M.D., Department of Dermatology, University of Ghent, Ghent, Belgium.

Radioactive substrates were used to study the metabolism of purine and pyrimidine bases, ribose and deoxyribose nucleosides in normal and pathological epidermis. The presence of a purine nucleoside (phosphorylase and of uridine and thymidine phosphorylases) was confirmed. Deaminating enzymes are also present. In the presence of phosphoribosyl-pyrophosphate or adenosine triphosphate, nucleotides are formed from adenine, hypoxanthine, and uracil. The catabolism of pyrimidine bases was also investigated.

2. **CELL-FREE PROTEIN SYNTHESIS IN MAMMALIAN SKIN.** IRWIN M. FREEDBERG, M.D., I. HOWARD FINE, M.D., and F. H. CORDELLE, A.B., Department of Medical Research, Beth Israel Hospital and Department of Dermatology, Harvard Medical School, Boston, Massachusetts.

Characterization of the early steps of keratin biosynthesis and more complete elucidation of the mechanism of action of therapeutic agents upon epidermis require a cell-free amino acid incorporating system. The fibrous structure of the skin and the ribonuclease content of epidermis have previously prohibited development of such a tool.

Utilizing a liquid nitrogen technique by which tissue is rapidly frozen and pulverized, we have demonstrated that amino acid incorporation occurs in a cell-free system derived from mammalian skin. Requirements include ribosomes, a fraction derived from the cell-sap, 4 nucleoside triphosphates and an energy generating system. The magnesium requirement is rigid and the system is exquisitely sensitive to ribonuclease. Particulate and supernatant components have been characterized and compared to similar derivatives from other organs.

3. **SOLUBLE SUBSTANCES AND ANTIGENS OF HUMAN EPIDERMIS. (ANALYSIS OF THE SOLUBLE COMPONENTS OF EPIDERMIS AND ITS HORNY DERIVATIVES BY ELECTROPHORESIS AND IMMUNOELECTROPHORESIS.)** J. PROCHAZKA FISHER, M.D., College of Physicians and Surgeons, Columbia University, New York, N.Y.

This report describes an inquiry into antigenicity and nature of soluble substances contained in extracts of normal human epidermis and its horny derivatives. Starch gel-, agar gel- and immuno-electrophoresis were employed to study these components. Absorbed rabbit anti-epidermis serum was used to detect epidermal components immunologically different from blood proteins.

Certain rather characteristic patterns of immunoprecipitate arcs differentiated corporeal epidermis, palmar and plantar epidermis, ichthyosis scales and hyperkeratosis callus. One component endogen-

ous to cellular epidermis and keratinized epidermis was revealed as an SH-group carrier by staining reactions. Two additional SH-carrying components were identified in extracts of rapidly keratinizing callus.

The nature of other components remained obscure, except for two which are thought to represent catabolites of serum albumin.

4. **ISOLATION OF EPIDERMAL SUBCELLULAR PARTICLES CAPABABLE OF INDEPENDENT RESPIRATION.** FILLMORE K. BAGATELL, Ph.D., M.D., KSENIJA DIMITROV and KATHLEEN DUGAN, B.S., Section of Dermatology, Western Reserve University, Cleveland, Ohio.

Subcellular particles were isolated by conventional techniques from the epidermis of neo-natal rats. The uptake of oxygen with succinate and other substrates was followed by means of a Clark oxygen electrode. Present in the reaction chambers were the particles suspended in sucrose solution, magnesium chloride, phosphate and tris buffers and substrate. Endogenous respiratory activity was negligible. Respiration with succinate as substrate was inhibited by malonate, cyanide and cantharidin. Some phosphorylation was noted when ADP was added. This study presents a method for the isolation of consistently reproducible activities associated with mitochondria.

5. **STUDIES IN THE BIOCHEMISTRY OF SKIN IV. SOME PROPERTIES OF MITOCHONDRIA ISOLATED FROM THE EPIDERMIS OF THE ADULT WHITE RAT.** THEODORE ROSETT, Ph.D. and MUNEO OHKIDO, M.D., Department of Biochemistry and Division of Dermatology, Duke Medical Center, Durham, North Carolina.

Mitochondria have been isolated from homogenized, stretch-separated epidermis of the adult white rat, using density gradient centrifugation. Malic dehydrogenase activity was used as a biochemical marker, and the results confirmed by electron microscopy.

Epidermal mitochondrial respiratory activity is low, but can be potentiated by the addition of an inactivated, heated, sonicated extract of liver mitochondria. Net phosphate uptake by epidermal mitochondria cannot be demonstrated because of their very high Apyrase activity. However, ^{32}P was incorporated into ATP when the mitochondria were incubated with the Apyrase inhibitor, fluoride ion, substrate, ADP, large amounts of ATP, and ^{32}P orthophosphate.

6. **BIOCHEMICAL DEMONSTRATION OF LYSOSOMES IN THE EPIDERMIS.** CHARLES H. DICKEN, M.D., and RICHARD H. DECKER, Ph.D., Section of Dermatology (Dr. Dicken) and Section of Biochemistry (Dr. Decker), Mayo Clinic, Rochester, Minnesota.

Biochemical criteria were used to ascertain the presence of lysosomes in epidermis of man and the hairless mouse. An epidermal homogenate in sucrose showed activity of several of the acid hydrolases of lysosomes. Upon centrifugation a portion of this activity sedimented with fractions associated with lysosomes of other tissues (500-12,000 g) and showed a 3-5 fold increase in specific activity over the homogenate. Latency of enzyme activity in the fraction was demonstrated with triton-x-100 but could not be shown with freezing and thawing, pH, and hypotonicity. The properties of lysosomes in skin will be compared to those of other tissues.

7. **THE SHORT CHAIN FATTY ACIDS (BELOW C_{12}) OF HUMAN SURFACE LIPIDS.** ROBERT E. KELLUM, M.D., Division of Dermatology, University of Oregon Medical School, Portland, Oregon.

The earliest histologic changes demonstrable in acne vulgaris (edema of the wall of the sebaceous duct and hair follicle, followed by rupture) have caused many investigators to search for an inflammatory agent in the sebum. When human surface lipid is fractionated into its various lipid classes and injected intradermally, only the free fatty acid fraction produced the massive inflammatory response characteristic of acne vulgaris. Thus, the free fatty acids have been suggested to be the irritant factor producing the clinical lesions of acne vulgaris. Although the fatty acids with chain lengths greater than C_{12} have been examined in detail, no report has appeared of the short chain fatty acids with chain lengths below C_{12}. Such a study will be reported, and the possible role of these short chain fatty acids of human surface lipid in the etiology of acne vulgaris will be discussed.

8. **LIPOGENESIS IN HUMAN SKIN. IV. *IN VITRO* RATE STUDIES.** ROBERT D. GRIESEMER, M.D. and ROBERT W. THOMAS, Department of Dermatology, Harvard Medical School, Massachusetts General Hospital, Boston, Massachusetts.

Normal human breast skin from 19 subjects was incubated with acetate-1-C^{14} and squalene, cholesterol and fatty acids extracted for radioactivity measurement in a scintillation counter. Millimicromoles of acetate converted to lipid per hours per gram of skin were constant for incubation periods from 10 minutes to 6 hours. The rate of synthesis of individual fatty acids, separated and collected by gas-liquid chromatography, was constant also for these incubation periods. 45% of the label was in palmitate, 10% in oleate; whereas, palmitate comprised 25% and oleate 50% of fatty acids of human skin before incubation. Reasons for this difference are discussed.

9. **DEFICIENT SKIN SURFACE CHOLESTEROL ESTERIFYING ABILITY AMONG RELATIVES OF PSORIATICS.** AGNES B. GARA, M.S., GARY L. PECK, M.D., and ALLAN L. LORINCZ, M.D., Section of Dermatology, Department of Medicine, The University of Chicago, Chicago, Illinois.

Clinically normal parent, sibling, and child adult relatives of psoriatic persons were examined in regard to skin surface cholesterol esterifying ability. In a series of normal adult subjects having no family history of psoriasis over 2.0% of the recovered radioactivity was in the cholesterol ester fraction. By comparison, in nine of nineteen apparently normal relatives of psoriatic persons less than 1.5% of the recovered radioactivity was in the cholesterol esters. This finding suggests that the deficient skin surface cholesterol esterifying ability previously noted in psoriatics occurs as a probably dominantly inherited anomaly in psoriatic families.

10. **A STUDY OF LIPOGENESIS IN SKIN OF DIABETIC PATIENTS.** S. L. HSIA, Ph.D., Departments of Dermatology and Biochemistry, University of Miami School of Medicine, Miami, Florida.

Skin biopsy of patients with diabetic ketoacidosis were incubated with sodium acetate-1-^{14}C. After hydrolysis with potassium hydroxide, the lipids were extracted and then separated into the fatty acid

fraction and the nonsaponifiable fraction by a convenient paper chromatographic method. The amounts of ^{14}C incorporated into the two fractions were determined. Specimens were taken from the same patients after the acidosis was corrected with insulin. The ^{14}C incorporated into the two lipid fractions were found to be 150% to 350% of the pre-treatment values.

11. LIPID METABOLISM IN THE SKIN OF NOMAL AND MUTANT (ASEBIC) MICE. DAVID I. WILKINSON, Ph.D. and MARVIN KARASEK, Ph.D., Department of Dermatology, Stanford University School of Medicine, Palo Alto, California.

One third of the fatty acids esterified to cholesterol in the surface skin lipids of normal mice have very long (27-36) carbon chains. Mutant mice, lacking sebaceous glands, exhibit a nearly complete absence of such acids, a complete lack of wax monoesters and greatly reduced amounts of wax diesters as well as a large increase in free cholesterol. These deficiencies exist in the epidermal lipids also, and thus indicate a fundamental inability of the epithelial cell to synthesize these metabolic products; the unusual composition of the surface lipids cannot be attributed to the cessation of sebaceous outflow. Restriction of the mutants' lipid intake results in premature death.

12. STUDIES ON BLISTERS PRODUCED BY FRICTION. MARION B. SULZBERGER, M.D., LEONARD FISHMAN, CAPTAIN, MC, U.S.A.R. and BENJAMIN WELLS, MAJOR, MC, U.S.A., Dermatology Research Section, Research and Development Service, Letterman General Hospital, San Francisco, California.

In contrast to thermal, chemical, immunologic and pathologic blistering, friction blisters, one of man's most common reactions to trauma, have received little scientific study.

An apparatus was constructed to produce blisters with controlled frictional force, temperature, humidity, and with different rubbing materials.

Over two hundred experiments showed that blister formation requires: sufficiently friction-resistant superficial skin layers to form the roof; a shearing effect transmitted to form a cleft just below the granulosum; vessel permeability to permit serous fluid to fill the cleft. When arterial pressure is sufficiently reduced during friction and/or a short time thereafter no blister fluid accumulates.

MORNING SESSION

8:30 A.M. BUSINESS AND EXECUTIVE SESSION

1. Election of Officers
2. Election of Members
3. Appointment of Committees
4. Selection of Time and Place of Next Annual Meeting
5. Miscellaneous Business

SCIENTIFIC SESSION

1. **CHARACTERISTICS OF ACCOMMODATED (HARDENED) SKIN.** DON E. McOSKER, Ph.D. and L. W. BECK, Ph.D., The Proctor and Gamble Company, Miami Valley Laboratories, Cincinnati, Ohio.

   Studies on the accommodation (hardening) process in guinea pig skin generally reveal a hyperplastic epidermis but little dermal change. The reaction is localized to the test site and has been shown to be non-specific. Accommodation to soap or anionic surfactants results in skin protection to other anionic, cationic, non-ionic, and amphoteric surfactants. The time required to obtain accommodation is dependent upon the concentration of the agent used. With continued exposures the accommodated state will persist; upon discontinuation of the exposures the skin reverts to normal in about 28 days. Absorption studies demonstrate that accommodated skin is more permeable to methyl nicotinate and the accommodating agent than normal skin but much less permeable than irritated skin.

2. **REGIONAL VARIATION IN PERCUTANEOUS PENETRATION OF ^{14}C CORTISOL IN MAN.** ROBERT J. FELDMANN, M.D. and HOWARD I. MAIBACH, M.D., Division of Dermatology, University of California, San Francisco Medical Center, San Francisco, California.

   This study quantitates percutaneous penetration of cortisol by measurement of ^{14}C in urine. Each subject served as his own comparison for the various anatomic sites.

   Differences were noted in total excretion and in the times of appearance. All areas are compared to the ventral forearm, which averaged 0.85% excretion of the dose applied: ventral forearm 100%; foot arch 30%; dorsal forearm 90%; palm 95%; axilla 400%; scalp 400%; forehead 1,000%; angle of jaw 1,600%; scrotum 3,000%. The palm and the arch of the foot showed a delay in penetration.

   With the exception of the scrotum increased penetration correlates with increased number of hair follicles. We will discuss the role of percutaneous versus transfollicular penetration.

3. **MECHANISM OF PERCUTANEOUS ABSORPTION, II. THE ROLE OF TRANSIENT DIFFUSION IN DETERMINING THE RELATIVE IMPORTANCE OF VARIOUS ROUTES OF SKIN PENETRATION.** ROBERT J. SCHEUPLEIN, Ph.D., Department of Dermatology, Harvard Medical School, Boston, Massachusetts.

   Permeability measurements on the skin *in vivo* and *in vitro* seemingly lead to different conclusions concerning whether diffusion

through the bulk of the stratum corneum or through the appendages is the more signficant route of penetration. Using the known diffusion parameters of the skin and the classical relations governing passive diffusion, descriptions of transient as well as steady-state diffusion processes have been obtained. The analysis considers the entire diffusion route through the skin from the stratum corneum to the capillary walls. The appendageal route is shown to be of potentially greater significance than bulk diffusion in the initial transient stages of *in vivo* penetration (< 1 hour). Bulk diffusion becomes more important at later times in agreement with steady state *in vitro* observations.

4. **ULTRASTRUCTURAL CHANGES IN THE HORNY LAYER FOLLOWING LOCAL APPLICATION OF DIMETHYLSULFOXIDE (DMSO).** LEOPOLDO F. MONTES, M.D., JACK L. DAY, and CHARLOTTE J. WAND, Department of Dermatology, Baylor University College of Medicine, Houston, Texas (Dr. Montes and Miss Wand), Space Medicine Branch, Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas (Mr. Day).

   Guinea pigs were treated topically with a 90% aqueous solution of Dimethylsulfoxide (DMSO). Skin specimens from treated areas, from symmetrical untreated sites and from control animals were processed simultaneously for electron microscopy. Biopsies were performed 1/2, 1, 2, 3, 4, 5, 6, 7, 8, 24 and 48 hours after treatment. Within six hours the keratinized cells undergo striking changes. Low opacity areas of the superficial horny layer enlarge and predominate over the fibrills; the network of the intermediate horny layer disappears. The basal horny layer becomes light. While this occurs within cells, the plasma membranes seem to remain intact.

5. **HISTOCHEMICAL AND ELECTRON MICROSCOPIC STUDIES OF CALCIFYING EPITHELIOMA INDUCED BY POLYOMA VIRUS.** KEN HASHIMOTO, M.D., LODEWIJK A. MAGRE, M.D. and WALTER F. LEVER, M.D., Tufts University School of Medicine and Dermatology Research Laboratories, New England Medical Center Hospitals, Boston, Massachusetts.

   Various skin tumors have been produced by inoculating polyoma virus into new-born mice of C3H/Bi strain. Among others, tumors similar to human calcifying epithelioma of Malherbe were studied. Tumors showed intense SH-stains and a strong birefringence. With the electron microscope the characteristic cells of the hair cortex, cuticular cells, and Huxley and Henle cells were identified. Some tumor cells were calcified and others contained crystalline arrays of viral particles. It will be shown that these tumors completely satisfy all of the histochemical and fine structural criteria for the diagnosis of calcifying epithelioma in the human being (Hashimoto et al. J. Invest. Derm., in press).

6. **ELECTRON MICROSCOPIC EVIDENCE FOR A BACTERIOPHAGE CYCLE IN DIPHTHEROIDS OBSERVED IN HUMAN SKIN.** LEOPOLDO F. MONTES, M.D., C. ALAN PHILLIPS, M.D., SAMUEL H. BLACK, Ph.D., and MOLLIE E. McBRIDE, Ph.D., Departments of Dermatology and Microbiology, Baylor University College of Medicine, Houston, Texas.

   During an electron microscopic investigation of erythrasma lesions, clear evidence was obtained for a cycle of bacteriophage development

in diphtheroids in human skin. Numerous intracellular phages were seen in diphtheroids proliferating on the skin surface and within the stratum corneum.

Both the bacterial nucleoplasm and cytoplasm were sites of phage accumulation. Bacterial forms resembling the "ghosts" that result from lysis of *Escherichia coli* by coliphage T_2 were also observed. This, and the presence of free phages in the horny layer indicates that ejection of the viral content during bacterial lysis may occur in the skin.

7. **EXPERIMENTS ON THE BIOLOGY OF FUNGOUS INFECTIONS OF THE FEET.** STANLEY A. ROSENTHAL, Ph.D. and RUDOLF L. BAER, M.D., Department of Dermatology, New York University Medical Center, New York, N.Y.

Experimental studies were carried out in over 125 human volunteers whose mycologically healthy feet were deliberately exposed to suspensions of dermatophytes. Groups of volunteers were exposed to fungi (a) without preceding trauma, (b) with non-blistering trauma to selected sites on the toe webs and soles and (c) with blistering trauma to selected sites on the toe webs and soles. No technics producing maceration or occlusion were used.

A significant incidence of symptomatic disease were induced in blistered and fungus-exposed sites, demonstrating the important role of trauma in the occurrence of fungous disease of the feet. The incidence of persistent symptomatic infection, transient symptomatic infection, persistent asymptomatic infection ("healthy carrier state") and transient asymptomatic infection will be reported.

8. **EFFECT OF ORALLY ADMINISTERED ANTIBACTERIAL AGENTS ON TITRATABLE ACIDITY OF HUMAN SEBUM.** JOHN S. STRAUSS, M.D. and PETER E. POCHI, M.D., Department of Dermatology, Boston University Medical Center, Boston, Massachusetts.

The measurement of titratable acidity is an indicator of the free fatty acids in sebum. In a previous study it has been shown that orally administered tetracycline will decrease the titratable acidity of human surface sebum. In this study, it will be demonstrated that erythromycin in a dose of 1 gm. per day also produces a definite decrease in the titratable acidity in human surface sebum. In contrast, daily oral doses of penicillin as much as 2,400,000 units, sulfisoxazole 4 gm., or sulfadimethoxine 0.5 gm. do not have any effect upon the titratable acidity.

9. **EFFECT OF CYCLIC ADMINISTRATION OF CONJUGATED EQUINE ESTROGENS ON SEBUM PRODUCTION IN WOMEN.** PETER E. POCHI, M.D. and JOHN S. STRAUSS, M.D., Department of Dermatology, Boston University Medical Center, Boston, Massachusetts.

Conjugated equine estrogens were administered cyclically for 15-24 weeks to 16 female subjects in order to study the effect of this estrogen preparation on sebaceous gland activity. Quantitative measurements of sebum production were performed before and weekly during drug administration. Twenty-four separate trials of drug administration were made. Dosages of 2.5, 5.0 and 7.5 mg. daily were used, in cycles of 2 or 3 weeks. Results showed no significant decrease in sebum production with 2-week cyclic treatment. Three-week cyclic administration reduced sebaceous secretion with doses of 5.0 and 7.5 mg. daily and, occasionally, with 2.5 mg.