THE DIAGNOSTIC VALUE OF SKIN BIOPSIES

FRANCIS A. ELLIS, M.D.
Baltimore, Maryland

This investigation was undertaken at the request of medical students, post-graduate students, general pathologists and others interested in pathology of the skin who wished to be informed about the value of biopsies in the determination of diagnoses in skin diseases.

INTRODUCTION

Biopsy is the removal, preparation and microscopic examination of normal or diseased tissue taken from the living body. Although many biopsies give pathognomonic findings and thus establish diagnoses, others may not be diagnostic, but may tend to confirm the presence of certain diseases and/or exclude that of other diseases. In other conditions, the microscopic findings may be simply suggestive, or compatible with the clinical diagnosis. The microscopic findings in common banal inflammations, as the erythemas due to external irritation, mild dermatitis and acute and chronic "eczemas" may not be diagnostic, but the histologic studies may nevertheless be helpful when considered in conjunction with the clinical diagnosis.

PROPER TECHNIC IN PERFORMING BIOPSIES

It is important that the biopsy be taken from a typical lesion, from the proper location and at the right stage of evolution. An involuting lesion may not show the true picture, nor may one that has been altered as by excoriations, or external irritation factors such as topical treatment or roentgen ray therapy. A lesion may not be diagnostic because it was taken by a faulty technic from an atypical lesion or was improperly prepared.

In the preparation of cutaneous biopsies, it is usually important that the biopsy be prepared by a suitable technic, that too harsh or rapid fixatives are not used, that the dehydration and staining be performed by more meticulous technic than is usually followed in the preparation of general surgical biopsies. In other words, frequently a cutaneous biopsy taken by a surgeon and processed by a general pathologist cannot be properly interpreted by a trained dermato-pathologist, because the finer points in the cytology are distorted by the technic employed in preparing the section. This is not usually true of tumors; but even in tumors occasionally details cannot be demonstrated due to unsuitable technic in obtaining and preparing the specimen.

EXAMINATION OF BIOPSIES

The students, whether under-graduates or post-graduates, and even a trained observer should follow out a routine in examining sections in order not to miss some diagnostic point in the biopsy. In general, the instructions of Weidman at the Academy of Dermatology and Syphilology for post-graduate students is a good guide. First examine the section with the reverse ocular. This will show the general structure of the epidermis, the relative amount of keratosis, acanthosis, the thickening of the rete, the gross architecture of the dermis and the pattern as a whole.

Then with the low power, the epidermis is examined, first noting the keratin layer, whether it is thickened or decreased, the amount of parakeratosis, the presence of plugging, the acanthosis, the amount of stratum lucidum, and granular layer. Next examine the rete

Received for publication October 22, 1948.

layer, noting the presence of edema, whether intercellular or intracellular, balloon degeneration, infiltration, mitosis, dyskeratotic cells, absence of prickles and other alterations that may aid in the interpretation of the slides. The cells in the basal layer should be examined for mitosis, pigmentation, acanthosis, acantholysis, exocytosis and other alterations.

Following this, the cutis should be examined noting first the changes in the papillary layer, again the liquefaction at the basal layer, the changes in the mid-cutis and in the deeper layers of the cutis and finally those in the subcutaneous tissue or fatty layer. Then attention should be directed to the type of cellular infiltrate, whether it is perifollicular, perivascular, the type of cells present and the amount of fibrosis. The changes in the collagen and elastic tissues can usually be studied with hemotoxin and eosin stains but occasionally special stains will be indicated. The various skin appendages (sebaceous glands, sweat glands, smooth muscles, and hair follicles) whould be studied, and their relation to the infiltrate. Finally one should attempt to correlate the findings into a pathologic picture.

THE VALUE OF CUTANEOUS BIOPSIES: SUMMARY OF FOURTEEN REPLIES TO THE QUESTIONNAIRE

0. Diseases due to prenatal influence

	Number of Answers	*Average Percentage*	*Range of Percentage*
Adenoma sebaceum*	12	75%	25–100
Cutis verticis gyrata	8	30%	0–100
Dermatolysis (cutis laxa)	7	55%	25–100
Edema neonatorum	8	44%	0–100
Epidermolysis bullosa	12	60%	25–100
Epidermolysis bullosa acquisita	10	52%	0–100
Epidermodysplasia verruciformis	12	92%	75–100
Erythoderma ichthyosiforme congenitum	10	50%	0–100
Hemangioma congenitale	12	96%	75–100
Ichthyosis	11	77%	50–100
Keratoma congenitale	6	54%	0–100
Keratosis follicularis	12	98%	75–100
Keratosis palmaris et plantaris	10	63%	25–100
Keratosis punctata	9	42%	0–100
Lentigo	11	80%	25–100
Lichen spinulosus	10	65%	0–100
Lymphangioma circumscriptum congenitale	12	94%	50–100
Mongolian spot	11	89%	0–100
Multiple benign cystic epithelioma	12	94%	50–100
Nevus, anemicus	7	21%	0–50
Nevus, blue	12	98%	75–100
Nevus, comedonicus	10	83%	50–100
Nevus, fibrosus	8	75%	50–100
Nevus, linearis	9	50%	0–100
Nevus, lipomatosus	9	65%	0–100
Nevus pigmentosus	13	89%	0–100
Nevus, pilosus	10	90%	0–100
Sclerema neonatorum	9	45%	0–100
Syringocystadenoma	9	90%	50–100
Trichostasis spinulosa	8	94%	50–100
Urticaria pigmentosa	13	92%	75–100
Xeroderma pigmentosum	12	67%	25–100
Xerosis	9	30%	0–75

* Name of diseases from "Standard Nomenclature—A. M. A. 1942."

1. Diseases due to infection with lower organism

	Number of Answers	*Average Percentage*	*Range of Percentage*
Acne conglobata	7	65%	0–100
Acrodermatitis continua	7	30%	0–50
Amebiasis of skin	11	75%	25–100
Anthrax	7	70%	25–100
Atrophoderma maculatum, due to syphilis	8	50%	0–100
Carbuncle	8	60%	0–100
Cellulitis	9	64%	25–100
Dermatitis infectiosa eczematoides	7	43%	0–100
Dermatitis seborrheica	9	33%	25–100
Ecthyma	8	50%	0–100
Erysipelas	9	60%	25–100
Erysipeloid	6	42%	25–75
Erythema multiforme	9	53%	25–100
Erythema nodosum	11	70%	50–100
Folliculitis keloidalis	8	70%	25–100
Folliculitis decalvans	6	50%	25–75
Frambesia tropica (yaws)	8	66%	50–100
Furuncle	9	73%	0–100
Granuloma inguinale	10	67%	25–100
Granuloma pyogenicum	12	100%	100
Herpes simplex (Kaposi's varicelliform eruption and varicella)	12	77%	25–100
Herpes zoster	12	75%	25–100
Hidradenitis suppurativa	9	60%	25–100
Impetigo contagiosa	11	86%	25–100
Keratosis blenorrhagica	5	55%	25–100
Leishmaniasis americana	6	83%	50–100
Leishmaniasis of skin	7	86%	50–100
Lepothrix	6	100%	100
Leprosy	13	71%	50–100
Lupus erythematosus chronic discoid	12	77%	25–100
Lupus erythematosus disseminatus	12	75%	25–100
Lymphogranuloma venereum	9	55%	25–100
Molluscum contagiosum	13	96%	50–100
Nodular nonsuppurative panniculitis	11	73%	25–100
Nodules, juxta-articular, due to syphilis	10	53%	0–100
Pemphigus, acute, septic	11	57%	25–100
Perifolliculitis capitis abscedens et suffodiens	11	40%	0–75
Pityriasis simplex	5	10%	0–25
Pyoderma gangrenosum	5	40%	25–50
Rhinoscleroma	13	96%	75–100
Sarcoidosis of skin	13	90%	25–100
Sycosis vulgaris	6	54%	50–75
Syphilis of skin, primary or secondary	12	80%	50–100
Syphilis of skin, tertiary	12	75%	50–100
Tuberculosis lichenoides (lichen scrofulosus)	11	80%	50–100
Tuberculosis verrucosa cutis	13	80%	75–100
Tuberculosis luposa (lupus vulgaris)	12	80%	50–100
Tuberculosis due to inoculation	11	80%	0–100
Tuberculosis orificialis	10	77%	25–100
Tuberculosis miliaria disseminata	10	83%	50–100

	Number of Answers	*Average Percentage*	*Range of Percentage*
Tuberculosis miliaria disseminata faciei	11	84%	50–100
Tuberculosis (rosacea-like)	10	72%	25–100
Tuberculosis colliquativa (scrofuloderma)	9	76%	50–100
Tuberculosis indurative (erythema induratum)	12	80%	25–100
Tuberculosis papulonecrotica	11	73%	50–100
Ulcus vulvae acutum	4	30%	0–50
Vaccin a (variola and eczema vaccinatum)	Diagnostic		
Verruca vulgaris	13	97%	75–100
Verruca acuminata	11	98%	75–100
Verruca plana	13	90%	50–100
Verruca peruana	3	80%	50–100
2. Diseases due to higher plant or animal parasite			
Actinomycosis of skin	13	95%	50–100
Blastomycosis of skin	13	98%	75–100
Chromoblastomycosis of skin	11	98%	75–100
Coccidioidomycosis of skin	11	96%	50–100
Cysticercosis of skin	6	100%	100
Dermatophytid	8	31%	0–50
Dermatophytosis	10	40%	0–100
Erythrasma	9	56%	0–100
Favus capitis	10	73%	0–100
Favus corporis	9	64%	0–100
Grounditch	3	33%	0–100
Larva migrans	9	80%	50–100
Moniliasis of skin	8	28%	0–75
Mycetoma	11	80%	25–100
Paracoccidioidomycosis of skin	8	84%	25–100
Pityriasis versicolor	10	65%	0–100
Sporotrichosis of skin	10	40%	25–75
Tinea corporis	9	35%	0–100
Torulosis of skin	9	80%	50–100
3. Diseases due to intoxication			
Argyria	13	90%	50–100
Cicatrix of skin due to chemical burn	6	70%	0–100
Dermatitis medicamentosa	9	42%	0–75
Dermatitis venenata	11	60%	25–100
Eczema	8	75%	50–100
Erythema toxicum	7	36%	0–75
Urticaria	10	50%	25–100
Urticaria papulosa	8	38%	0–75
4. Diseases due to trauma or physical agent			
Adiponecrosis neonatorum	10	88%	25–100
Callositas	12	75%	25–100
Clavus	11	70%	25–100
Dermatitis actinica due to ultraviolet radiation	8	45%	0–100
Dermatitis actinica due to roentgen rays (X-rays) or a radioactive substance	11	75%	50–100
Ephelides	10	60%	25–100

	Number of Answers	*Average Percentage*	*Range of Percentage*
Erythema ab igne	6	10%	0–25
Foreign body in skin	11	93%	50–100
Implanation cyst due to trauma	11	80%	25–100
Miliaria rubra (prickly heat)	9	72%	25–100
Unguis incarnatus	3	33%	0–100
5.0. Diseases due to circulatory disturbance or blood dyscrasia			
Angiokeratoma	12	92%	75–100
Dermatosis progressive pigmentary	9	47%	0–100
Elephantiasis nostras	8	44%	0–100
Erythrocyanosis crurum	5	15%	0–25
Leukemia cutis	13	80%	50–100
Leukemid	9	34%	0–75
Mycosis fungoides	13	83%	25–100
Purpura annularis telangiectodes	13	65%	25–100
Rhinophyma	12	77%	25–100
Rosacea	9	58%	25–100
5.5. Diseases due to disturbance of innervation or of psychic control			
Alopecia areata	9	44%	0–100
6. Diseases due to or consisting of static mechanical abnormality			
Milium	12	90%	50–100
Miliaria crystallina (sudamina)	9	64%	25–100
Hidrocystoma	11	93%	75–100
Steatoma	11	90%	50–100
Infected steatoma	11	80	25–100
7. Diseases due to disorder of metabolism, growth or nutrition			
Acne vulgaris	11	70%	25–100
Acromegaly of skin	4	20%	0–50
Atrophia senilis	11	64%	25–100
Choloasma	9	53%	25–100
Comedo	11	93%	50–100
Elastosis senilis	12	90%	50–100
Granulosis rubra nasi	7	36%	0–50
Hydroa vacciniforme	10	45%	25–75
Keratosis seborrheic	12	98%	75–100
Keratosis senilis	13	96%	75–100
Leukoderma	8	72%	25–100
Lipoid proteinosis	10	80%	50–100
Necrobiosis lipoidica diabeticorum	11	90%	75–100
Ochronosis	4	25%	0–50
Poikiloderma vasculare atrophicans	11	60%	25–100
Vitiligo	8	75%	25–100
Xanthelasma	13	96%	75–100
Xanthoma tuberosum multiplex	11	96%	75–100
Xanthoma disseminatum	11	90%	50–100
Xanthoma diabeticorum	11	84%	25–100

8. New growths

	Number of Answers	*Averag Percentage*	*Range of Percentage*
Adenocarcinoma sudoriferum	12	94%	50–100
Adenoma sudoriferum	12	94%	50–100
Bowen's disease	13	96%	75–100
Dermoid of skin	11	100%	100
Dermatofibroma (histiocytoma)	13	96%	75–100
Epithelioma (carcinoma), basal cell	13	100%	100
Epithelioma (carcinoma), squamous cell	13	100%	100
Epithelioma (carcinoma), transitional cell	12	93%	25–100
Erythroplasia of Queyrat, buccal	12	88%	25–100
Erythroplasia of Queyrat, vulva et penis			
Erythroplasia of Queyrat, linqual			
Fibroma of skin	12	98%	75–100
Fibroscaroma of subcutaneous tissue	12	94%	50–100
Glomus tumor	13	100%	100
Hemangioma of skin	12	100%	100
Keloid	13	90%	50–100
Leiomyoma of skin	13	96%	75–100
Lymphangioma of skin	13	100%	100
Melanoma of skin	13	100%	100
Multiple idiopathic hemorrhagic sarcoma	13	96%	75–100
Lipoma	12	96%	75–100
Neurofibromatosis	13	90%	50–100
Nevus araneus (plexiform hemangioma)	9	80%	0–100
Papilloma of skin	10	95%	75–100
Sarcoma of skin	12	96%	75–100
Secondary sarcoma of skin	12	85%	25–100
Secondary carcinoma of skin	12	92%	50–100

9. Diseases due to unknown or uncertain cause with the structural reaction alone manifest: hereditary and familial diseases of this nature

Acanthosis nigricans	13	85%	50–100
Acne varioliformis	8	43%	25–100
Acrodermatitis atrophicans chronica	10	65%	50–100
Amyloidosis of skin	12	98%	75–100
Atrophoderma maculatum	7	50%	25–100
Cheilitis exfoliative	5	40%	0–100
Cheilitis glandularis	7	54%	0–100
Colloid degeneration of skin	13	100%	100
Cornu cutaneum	13	100%	100
Dermatitis exfoliative	9	80%	100
Dermatitis exfoliative neonatorum	4	60%	50–75
Dermatitis herpetiformis	11	66%	25–100
Dermatosis papulosa nigra	12	85%	50–100
Erythema annulare centrifugum	9	25%	0–50
Erythema elevatum diutinum	12	81%	0–100
Erythema multiforme exudativum	11	50%	25–100
Fox-Fordyce disease	11	73%	25–100
Granuloma annulare	13	90%	50–100
Hodgkin's disease of skin	12	75%	25–100
Impetigo herpetiformis	7	50%	0–100
Keratosis pilaris	9	90%	50–100

	Number of Answers	*Average Percentage*	*Range of Percentage*
Kraurosis of vulva	11	70%	25–100
Leukoplakia buccalis	12	82%	25–100
Lichen nitidus	13	92%	25–100
Lichen planus	13	92%	50–100
Lichen sclerosus et atrophicus	12	96%	75–100
Neurodermatitis circumscripta (lichen chronicus simplex)	12	67%	25–100
Neurodermatitis disseminata (atopic eczema)	10	60%	25–100
Nodules, juxta-articular, not due to syphilis or yaws	7	46%	0–75
Parapsoriasis	11	48%	25–100
Pemphigus erythematosus	8	43%	0–100
Pemphigus foliaceus	9	55%	25–100
Pemphigus vegetans	10	70%	25–100
Pemphigus vulgaris	11	66%	25–100
Pityriasis lichenoides et varioliformis acuta	9	53%	25–75
Pityriasis rosea	11	55%	25–100
Pityriasis rubra	6	44%	25–100
Pityriasis rubra pilaris	10	50%	25–100
Pompholyx	8	44%	25–100
Porokeratosis	9	78%	50–100
Prurigo mitis	9	33%	0–100
Prurigo nodularis	11	45%	25–100
Pseudoxanthoma elasticum	12	96%	75–100
Psoriasis	12	83%	25–100
Sarcoid, Darier-Roussy	9	90%	75–100
Scleroderma adultorum	11	80%	25–100
Scleroderma generalized progressive	10	87%	25–100
Scleroderma localized (morphea)	11	94%	75–100
Striae distensae telangectasis, hereditary hemorrhagic	5	55%	25–100

In the first charts are listed most of the common and many of the rare skin diseases in the order that they appear in the Standard Nomenclature of Diseases (1942). They were rated 100%, 75%, 50%, 25% and 0% depending on a general estimate as to the percentage that would be diagnosed by the trained dermatohistopathologist by interpreting a rather typical section without the aid of a clinical history. If the observer thought that biopsies from a hundred cases of lichen planus could be diagnosed in 75% of the biopsies then the rating would be rated 75% diagnostic.

Some dermatologists may disagree with the final interpretation, because they have made special studies on the certain types of diseases. In the biopsies from these diseases, their diagnostic ability on the sections may be above that of the average well trained dermatopathologist. If the lesion is due to an infective organism, the finding and identifying of the organism in the biopsy may mean the difference between missing or making the proper diagnosis.

The following doctors participated by answering the questionnaire: Doctors William S. Becker; Herman Beerman; Marcus Rayner Caro; Zola Cooper; Lloyd Ketron; Henry E. Michelson; Carl W. Laymon; Hamilton Montgomery; Wilbert Sachs; Charles F. Sims; Stuart Way; Fred D. Weidman; and Louis H. Winer.

It should be assumed that the examiner of the biopsy had no information of

the clinical history and that the ratings were predicated on the following factors:

1. That the biopsy was from a typical clinical lesion.
2. That a representative lesion was removed at the proper stage of evolution
3. That the section was properly prepared.
4. That the section was large enough to contain all the important tissue changes.
5. That any necessary specially stained sections were available for study.
6. That the specific causative agents in certain infections such as blastomycosis, actinomycosis, etc., were present in the sections studied.

LIST OF THE DERMATOSES (EXCEPT SOME RARE DISEASES) IN WHICH BIOPSIES ARE FAIRLY (60% OR OVER) DIAGNOSTIC

0. Diseases due to prenatal influence

	Percentage
Adenoma sebaceum	79%
Epidermolysis bullosa	60%
Epidermodysplasia verruciformis	60%
Hemangioma congenitale	96%
Ichthyosis	77%
Keratosis follicularis	98%
Vesicular Darier's disease	Diagnostic
Lentigo	80%
Lichen spinulosus	65%
Lymphangioma circumscriptum congenitale	94%
Mongolian spot	89%
Multiple benign cystic epithelioma	94%
Nevus, blue	98%
Nevus, comedonicus	83%
Nevus, fibrosus	75%
Nevus, pilosus	90%
Nevus, pigmentosus	89%
Syringocystadenoma	90%
Urticaria pigmentosa	92%

1. Diseases due to infection with lower organism

Acne conglobata	65%
Anthrax	70%
Carbuncle	60%
Erysipelas	60%
Erythema nodosum	70%
Folliculitis keloidalis	70%
Frambesia tropica (yaws)	66%
Furuncle	73%
Granuloma inguinale	67%
Granuloma pyogenicum	100%
Herpes simplex (Kaposi's varicelliform eruption and varicella)	77%
Herpes zoster	75%
Hidradenitis suppurativa	60%
Impetigo contagiosa	86%
Leishmaniasis	86%
Leprosy	71%

	Percentage
Lupus erythematosus chronic discoid	77%
Lupus erythematosus disseminatus	75%
Molluscum contagiosum	96%
Nodular nonsuppurative panniculitis	73%
Rhinoscleroma	96%
Sarcoidosis of skin	90%
Syphilis, primary or secondary	80%
Syphilis, tertiary	75%
Tuberculosis lichenoides (lichen scrofulosus)	80%
Tuberculosis verrucosa cutis	80%
Tuberculosis luposa (lupus vulgaris)	80%
Tuberculosis due to inoculation	80%
Tuberculosis orificialis	77%
Tuberculosis miliaria disseminata	83%
Tuberculosis miliaria disseminata faciei	84%
Tuberculosis colliquativa (scrofuloderma)	76%
Tuberculosis indurativa (erythema induratum)	80%
Tuberculosis papulonecrotica	73%
Tuberculosis (rosacea-like)	72%
Vaccinia (variola and eczema vaccinatum)	Diagnostic
Verruca acuminata	98%
Verruca peruana	80%
Verruca plana	90%
Verruca vulgaris	97%

2. Diseases due to higher plant or animal parasite

Actinomycosis	92%
Blastomycosis	98%
Chromoblastomycosis	98%
Coccidioidomycosis	96%
Larva migrans	80%
Mycetoma	80%
Paracoccidioidomycosis	84%
Pityriasis versicolor	65%
Torulosis	80%

3. Diseases due to intoxication

Argyria	90%
Cicatrix	70%
Dermatitis venenata	60%
Eczema	75%

4. Diseases due to trauma or physical agent

Adiponecrosis neonatorum	88%
Callositas	75%
Clavus	70%
Dermatitis actinica due to roentgen rays (X-Rays) or a radioactive substance	75%
Ephelides	60%
Foreign body in skin	93%
Implanation cyst due to trauma	80%
Miliaria rubra (prickly heat)	72%

5.0. Diseases due to circulatory disturbance or blood dyscrasis

	Percentage
Angiokeratoma	92%
Leukemia cutis	80%
Mycosis fungoides	83%
Purpura annularis telangiectodes	65%
Rhinophyma	77%

6. Diseases due to or consisting of statis mechanical abnormality

Milium	90%
Hidrocystoma	93%
Steatoma	90%

7. Diseases due to disorder of metabolism growth or nutrition

Acne vulgaris	70%
Atrophia senilis	64%
Comedo	93%
Elastosis senilis	90%
Keratosis seborrheica	98%
Keratosis senilis	96%
Leukoderma	72%
Lipoid proteinosis	80%
Necrobiosis lipoidica diabeticorum	90%
Poikiloderma vasculare atrophicans	60%
Vitiligo	75%
Xanthelasma	96%
Xanthoma tuberosum multiplex	96%
Xanthoma disseminatum	90%
Xanthoma diabeticorum	84%

8. New growths—to indicate that a primary neoplasm has metastasized, add .0 at the end of the code

Adenocarcinoma sudoriferum	94%
Adenoma sudoriferum	94%
Bowen's disease	96%
Dermoid of skin	100%
Dermatofibroma (histocytoma)	96%
Epithelioma (Carcinoma), Basal Cell	100%
Epithelioma (Carcinoma), Squamous Cell	100%
Epithelioma (Carcinoma), Transitional Cell	93%
Erythroplasia of Queyrat	88%
Fibroma	98%
Fibrosarcoma	94%
Glomus tumor	100%
Hemangioma	100%
Keloid	90%
Leiomyoma	96%
Lymphangioma	100%
Melanoma	100%
Lipoma, subcutaneous	96%
Neurofibromatosis	90%
Nevus araneus (plexiform hemangioma)	80%
Papilloma of skin	95%
Sarcoma of skin	96%
Secondary carcinoma of skin	92%
Secondary sarcoma of skin	85%

9. Diseases due to unknown or uncertain cause with the structural reaction alone manifest: Hereditary and familial diseases of this nature

	Percentage
Acanthosis nigricans	85%
Acrodermatitis atrophicans chronica	65%
Amyloidosis of skin	98%
Colloid degeneration of skin	100%
Cornu cutaneum	100%
Dermatitis exfoliative	80%
Dermatitis herpetiformis	66%
Dermatosis papulosa nigra	85%
Erythema elevatum diutinum	81%
Fox-Fordyce disease	73%
Granuloma annulare	90%
Hodgkin's disease	75%
Keratosis pilaris	90%
Kraurosis of vulva	70%
Leukoplakia buccalis	82%
Lichen nitidus	92%
Lichen planus	92%
Lichen sclerosus et atrophicus	96%
Neurodermatitis circumscripta (lichen chronicus simplex)	67%
Neurodermatitis disseminata (atopic eczema)	60%
Pemphigus vegetans	70%
Porokeratosis	78%
Pseudoxanthoma elasticum	96%
Psoriasis	83%
Sarcoid, Darier-Roussy	90%
Scleroderma generalized progressive	87%
Scleroderma localized (morphea)	84%

DIGEST OF THE COMMENTS MADE BY THE PARTICIPATING DOCTORS

Dr. William S. Becker: There are, of course, all sorts of implications which modify one man's opinion. For instance, starting with the first diagnosis of adenoma sebaceum, there is always a question as to whether the condition signifies a real adenoma or adenomatous hyperplasia as is seen in practically all seborrheic individuals.

Then again I am assuming that no history or clinical findings accompany the specimen. However, we know that in dermatologic microscopic findings the clinical findings are extremely important. Yet we must not permit ourselves to be too subjective. Then, too, the diagnosis often depends on how many parts of the lesion are sectioned. I remember an instance where a verrucous lesion appeared on a boy's thumb, presumably after he had cut himself while whittling. I made a clinical diagnosis of tuberculosis verrucosa cutis and the first section that I examined from one-half of the specimen was rather typical for that disorder. However, when the other half of the tumor was examined, I found typical intraepidermal vesicles with blastomycetes. The first specimen had represented an allergic tuberculoid reaction which is not always diagnostic.

Dr. Herman Beerman: As you know, Dr. Weidman has for a long time insisted that a particular histologic picture may represent a variety of clinical diagnoses

since the skin has so few "keys upon which to play a tune". I think that this is a sound conclusion.

Dr. Zola Cooper: Concerning tuberculosis of the skin, having been under the influence of general pathologists to some extent, I am a little doubtful of the accuracy of breaking it down microscopically into the clinical types which dermatologists recognize.

Dr. Henry E. Michelson: It is almost impossible to grade one's diagnostic ability on so many of these conditions. I feel that if I were to see the patient and the section that my score would go up at least 25%. In some of the conditions, the clinical examination plus the section makes one able to make a diagnosis with almost 100% certainty; while in many of the diseases, the diagnosis is almost impossible on seeing the section alone. In other words, I believe that the dermatologist should also be his own pathologist providing he has sufficient training and ability.

For my part, I find that I need the greatest help in cases of suspected blood conditions and in classifying certain moles. In our own department, we keep in very close contact with the Professor of Pathology.

Dr. Hamilton Montgomery: Lentigo—But rule out Xeroderma Pigmentosa.

Mongolian spot—Rule out blue nevus.

Urticaria Pigmentosa—If properly stained and syphilis is ruled out.

Biopsy usually only of negative value to rule out specific granuloma such as tuberculosis and syphilis. Pyoderma and Folliculitis from varying causes are not distinctive.

Leprosy—Ease of diagnosis varies according to type, etc.

Tuberculosis Miliaris Disseminata—Should be stained for bacilli.

Sarcoidosis of skin—Rule out leprosy, syphilis, etc.

Verruca Plana—Distinguish Acrokeratosis Hopf.

Keratosis Senilis—Distinguish other precancerous dermatoses.

Xanthoma Tuberosum Multiplex
Xanthoma Disseminatum
Xanthoma Diabeticorum
} But not from one another.

Bowen's disease—Rule out other precancerous dermatoses.

Fibroma of skin
Keloid
} May not distinguish between.

Dermatitis Exfoliativa—Depends on cause.

Hodgkin's disease of skin—If true infiltration of skin.

Kraurosis of vulva—Distinguish senile atrophy of vulva.

Lichen Planus—If syphilis; Lupus Erythematosus; drug eruptions have been ruled out.

Dr. Fred Weidman: Taking into account the changes in anatomy that take place depending on the stage of the lesion; lichen planus for example, if this is what you mean, it's a job except in the commoner dermatosis. None of us see enough rhinoscleroma to know how commonly it appears in typical form. The presence of so many dermatoses in this list that are "queers" introduces a large factor of uncertainty that can play havoc with your statistics. You would get a

result that was more significant if you conformed the list to those dermatoses, that we see a reasonable number of—or at least cut out the "queers".

SUMMARY OF ZEROS

0. Diseases due to prenatal influence

	Number of zeros	*Number of answers*	*Average Percentage*	*Percentage without zeros*	*Increase percentage with zeros*
Cutis verticis gyrata	3	8	30%	50%	20%
Edema neonatorum	1	8	44%	50%	6%
Epidermolysis bullosa acquisita	1	10	52%	64%	12%
Erythroderma ichthyosiforme congenitum	1	10	50%	55%	5%
Keratoma congenitale	1	6	54%	65%	11%
Keratosis punctata	1	9	42%	47%	5%
Lichen spinulosus	1	10	65%	72%	7%
Mongolian spot	1	11	89%	97%	8%
Nevus anemicus	4	7	21%	50%	29%
Nevus linearis	1	9	50%	56%	6%
Nevus lipomatosus	1	9	65%	72%	7%
Nevus pigmentosus	1	13	90%	99%	9%
Nevus pilosus	1	10	75%	83%	8%
Sclerema neonatorum	1	9	45%	56%	11%
Xerosis	1	9	30%	35%	5%

Number of diseases, 15—Number of zeros, 20.
Average increase percentage omitting zeros, 10%.

---

1. Diseases due to infection with lower organism

Acrodermatitis continua	1	7	30%	33⅓%	3%
Atrophoderma maculatum, due to syphilis	1	8	50%	59%	9%
Carbuncle	1	8	60%	65%	5%
Dermatitis infectiosa eczematoides	1	7	43%	50%	7%
Ecthyma	1	8	50%	59%	9%
Furuncle	1	9	73%	81%	8%
Nodules, juxta-articular, due to syphilis	1	10	53%	60%	7%
Perifolliculitis capitis abscedens et suffoidiens	1	6	30%	35%	5%
Pityriasis simplex	3	5	10%	25%	15%
Tuberculosis due to inoculation	1	11	74%	80%	6%
Ulcus vulvae acutum	1	5	30%	37%	7%

Number of diseases, 11—Number of zeros, 13.
Average increase percentage omitting zeros, 7.4%.

---

2. Diseases due to higher plant or animal parasite

Dermatophytid	2	8	31%	40%	9%
Dermatophytosis	2	10	40%	50%	10%
Erythrasma	1	9	56%	63%	7%
Favus capitis	1	10	73%	80%	7%
Favus corporis	1	9	64%	72%	8%
Ground itch	2	3	33%	100%	67%
Moniliasis of skin	1	8	28%	32%	4%

	Number of zeros	*Number of answers*	*Average Percentage*	*Percentage without zeros*	*Increase percentage with zeros*
Pityriasis versicolor	1	10	65%	73%	8%
Tinea corporis	2	9	35%	47%	12%

Number of diseases, 9—Number of zeros, 13.
Average increase percentage omitting zeros, 15%.

3. Diseases due to intoxication

Cicatrix of skin due to chemical burn	1	6	70%	85%	15%
Dermatitis medicamentosa	1	9	42%	47%	5%
Erythema toxicum	2	7	36%	40%	4%
Urticaria papulosa	1	8	38%	42%	4%

Number of diseases, 4—Number of zeros, 5.
Average increase percentage omitting zeros, 7.0%.

4. Diseases due to trauma or physical agent

Dermatitis actinica due to ultraviolet radiation	2	8	45%	50%	5%
Erythema ab igne	4	6	10%	25%	15%
Unguis incarnatus	2	3	33%	100%	67%

Number of diseases, 3—Number of zeros, 8.
Average increase percentage omitting zeros, 29%.

5.0. Diseases due to circulatory disturbance or blood dyscrasis

Dermatosis progressive pigmentary	1	9	47%	53%	6%
Elephantiasis nostras	1	8	44%	50%	6%
Erythrocyanosis crurum	2	5	15%	25%	10%
Leukemid	2	9	34%	38%	4%

Number of diseases, 4—Number of zeros, 6.
Average increase percentage omitting zeros, 6.5%.

5.5. Diseases due to disturbance of innervation or of psychic control

Alopecia areata	1	9	44%	47%	3%

Number of diseases, 1—Number of zeros, 1.
Average increase percentage omitting zeros, 3%.

7. Diseases due to disorder of metabolism growth or nutrition

Acromegaly of skin	2	4	20%	38%	18%
Granulosis rubra nasi	1	7	36%	42%	6%
Ochronosis	1	4	17%	25%	8%

Number of diseases, 3—Number of zeros, 4.
Average increase percentage omitting zeros, 11%.

Diseases due to unknown or uncertain cause with the structural reaction alone manifest: hereditary and familial diseases of this nature

	Number of zeros	*Number of answers*	*Average Percentage*	*Percentage without zeros*	*Increase percentage with zeros*
Cheilitis exfoliative	1	5	40%	50%	10%
Cheilitis glandularis	1	7	54%	62%	8%
Dermatitis exfoliative	1	9	80%	90%	10%
Erythema annulare contrifugum	2	9	25%	32%	7%
Erythema elevatum diutinum	1	12	81%	84%	3%
Impetigo herpetiformis	1	7	50%	56%	6%
Nodules, juxta-articular, not due to syphilis or yaws	1	7	46%	54%	8%
Pemphigus erythematosus	1	8	53%	61%	8%
Prurigo mitis	2	9	33%	40%	7%

Number of diseases, 9—Number of zeros, 11.
Average increase percentage omitting zeros, 7.7%.

DISCUSSION ON THE "ZERO'S" IN THE REPLIES

It is to be noted that there were a total of eighty-one zero answers (on 59 diseases) and if the zeros were left out, the percentage in these diseases would increase 7.5. Considering that fourteen doctors answered the questionnaire and 243 diseases were included, the percentage increase is relatively small. If one included the total decrease due to the eighty-one zeros against the total replies in the 243 diseases the average increase would be 2.5 per cent. The presence of one or more zeros where there were only a few replies on one disease may decrease markedly the final percentage, for example: in cutis verticis gyrata; there were eight answers and the presence of the three zeros changed the percentage from 60 to 30 per cent. In nevus anemicus the three zeros out of seven answers changed the percentage from 50 to 21. In pityriasis simplex three zeros out of five changed the percentage from 25 to 10; on erythema ab igne four zeros out of six changed the percentage from 25 to 10, and two zeros changed the percentage on unguis incarnatus on which there were only three replies from thirty-three to 100% when one left out the zeros.

It is to be noted that more than one zero usually occurred in diseases that would not be considered diagnostic. I would not consider a disease that received a rating of less than sixty per cent as fairly diagnostic by biopsy. In diseases receiving less than this rating, biopsy may be helpful because it rules out other pathologic processes. According to Montgomery[1] the histologic picture of many inflammatory dermatoses is suggestive without being diagnostic.

COMMENT

An attempt has been made by means of a questionnaire to determine the relative diagnostic value of biopsies from various cutaneous diseases.

One may question the accuracy of the method used to determine on the percentage basis of how diagnostic biopsies are from the different dermatologic diseases, but it was found that the percentages compiled from the first seven

replies, compared favorably with those compiled from the second seven replies and with the totals from the fourteen replies.

Perhaps a more accurate estimate of how diagnostic sections were from different dermatologic diseases could be determined by obtaining typical slides from each disease and presenting the slides before a board of experts and see how frequently these trained observers could arrive at the diagnosis of the disease from the study of the section alone. Even a well trained observer may at times miss the diagnosis or misinterpret the slide because he overlooked some diagnostic feature present in the slide. Although this article was written primarily to determine the value of biopsies without clinical aids in dermatoses, it should be stressed that in dermato-histopathology the clinical findings of the dermatologic disease are important aids in the evaluation of many skin biopsies.

REFERENCE

MONTGOMERY, H.: Value and limitations of biopsy in dermatology. Arch. Dermat. & Syph. **38:** 329 (Sept.) 1938.