BFGoodrich

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The BFGoodrich Company
3925 Embassy Parkway
Akron, Ohio 44313-1799

September 26, 1989

Mr. Gary Giebert
1100 Pozdras Street
Suite 2200
New Orleans, LA 70163-2200

RE: PVC TOXICITY AND BENIGN KERATOSIS

Dear Mr. Giebert:

As you may know, PVC (polyvinyl chloride) is a high molecular weight polymer of vinyl chloride monomer (VCM). Once VCM is polymerized to PVC, the potential for exposure to VCM is essentially nil. The main reasons for this are that PVC will not depolymerize or degrade to the monomer. Furthermore, the residual levels of VCM in the polymer are very low and tightly held within the polymer.

The toxicity of PVC (as well as VCM) has been studied extensively in both animals and in workers which have been exposed to PVC. None of these studies have ever reported that PVC (or VCM) caused benign keratosis. For this reason, I believe that the allegation that PVC causes benign keratosis is unfounded.

It is likely that other etiological factors are responsible for this dermatological occurrence. Therefore, I am providing some background information for your edification.

Sincerely,

THE BFGOODRICH COMPANY

Robert K. Hinderer, Ph.D.
Manager, Toxicology
Health and Environmental Services

90926-1/jp

cc: Mark Hross

2212701

CURRICULUM VITAE

Robert K. Hinderer

Date of Birth: February 6, 1946 Present Age: 43

Place of Birth: Elyria, Ohio

Marital Status: Married, four children

Education:

B.S. in Biology, Kent State University, Kent, Ohio
December, 1969; Major: Biology

M.S. Cleveland State University, Cleveland, Ohio
June, 1971; Major: Biology (Physiological Ecology)

Ph.D. University of Maryland, College Park, Maryland
December, 1974; Major: Entomology (Pesticide toxicology and metabolism)

Doctoral Dissertation Title: A comparative study of enzyme activities in various tissues of the rat and Japanese quail with respect to the metabolism of a herbicide and two insecticides

Advisor: Professor Robert E. Menzer, Ph.D.

Experience:

Jan. 1970-June, 1971: Graduate Assistant in Biology, Cleveland State University, working toward M.S. degree

Sept. 1971-June, 1972: Elementary Science Teacher, St. Ann's School, Washington, D.C. (part-time graduate student at University of Maryland)

June, 1972-July,1974: Graduate Assistant in Entomology, University of Maryland; working toward Ph.D. degree

April, 1974-Jan. 1975: Part-time consultant in insecticide toxicology for Ecosystems, Inc., McLean, Virginia

May, 1974-June, 1975: Teaching graduate level insecticide toxicology (lecture & laboratory)

July, 1974-June, 1975: Post-doctoral research, Univ. of Maryland, USDA, Pesticide Degradation Laboratory (Beltsville)

Jan. 1975-Mar. 1975: Research assistant for Technassociates, preparing EPA pesticide labels for IBM entry

July, 1975-June, 1977: Toxicologist, Ethyl Corporation, Toxicology and Industrial Hygiene Department, Baton Rouge, Louisiana

Experience (con't)

Feb. 1976: Toxicology lecturer, NIOSH Industrial Hygiene Training Course, New Orleans, Louisiana

June, 1977-Sept. 1971: Sr. Environmental Toxicologist and Manager of Toxicology, BFGoodrich Chemical Group, 6100 Oak Tree Blvd., Cleveland, Ohio

Sept. 1981-Jan. 1987: Sr. Toxicologist, BFGoodrich Co., Corporate Environmental Health Department, 500 S. Main St., Akron, Ohio 44318

1982-1983: Guest lecturer on chemical carcinogenicity graduate course, University of Akron, Akron, Ohio

Jan. 1987-present: Manager, Toxicology, BFGoodrich Co., Corporate Environmental Health Department, 3925 Embassy Parkway, Akron, Ohio 44313

Professional Activities:

Chapter President, American Institute of Biological Sciences, Cleveland State University (June 1970-June 1971)

Entomological Society of America (non-member participant, 1974)

Society of Toxicology (1974-present) non-member participant at Annual Meetings

American College of Toxicology - member

American Chemical Society - past member

Toxicology Subcommittee of the Ethylene Dichloride Technical Panel of the Manufacturing Chemists Assoc. (MCA) (1975-present) - member

Toxicology Subcommittee of the Vinyl Chloride Technical Panel (MCA) (1975-1977) - member

Toxicology Subcommittee of the Allyl Chloride/Epichlorohydrin Technical Panel (MCA) (1975-1977) - member

Toxicology Subcommittee of the Trichloroethylene Technical Panel (MCA) (1975-1977) - member

Vinyl Chloride Chronic Toxicity/Cancer Bioassay Audit Team of MCA Toxicology Subcommittee (1978) - member

American Industrial Health Council Task Force on the place of the mouse in carcinogenicity testing (1977-present) - member

National Institute of Environmental Health Sciences (NIEHS), Extrapolation II meeting (1976)

Professional Activities: (con't)

Third Veterinary Toxicology Symposium (1976)

NIEHS Conference on comparative metabolism and toxicity of vinyl chloride related compounds (1977) Bethesda, Maryland

Inorganic and Nutritional Aspect of Cancer (1977), a conference co-sponsored by NIH and International Assoc. of Bioinorganic Scientists, University of California, San Diego

Vinyl Chloride audit task force of MCA for long-term inhalation study of vinyl chloride, 1978-present

Toxicology Steering Committee, International Institute of Synthetic Rubber Producers (IISRP), 1978-present

Chemical Industry Institute of Toxicology, working on strategies for short-term testing for mutagens/carcinogens (1977) Research Triangle Park, North Carolina

ACS Polymer Conference on Stabilization, Degradation and Flammability of Polymers (1977) Akron, Ohio

Second International Symposium on Polynuclear Aromatic Hydrocarbons (1977) Battelle Columbus Laboratories, Columbus, Ohio

Environmental Cancer, a Report to the Public (1977), co-sponsored by the League of Women Voters of Texas Education Fund and League of Women Voters of Houston Education Fund in conjunction with Tenneco Chemicals, the Carcinogenesis Center of M.D. Anderson Hospital and Tumor Institute, and University of Texas Health Science Center, School of Public Health, Houston, Texas

Manuscript Reviewer, Journal of the National Cancer Institute, 1978

Testimony, "Health Aspects of Vinyl Chloride Emissions," California Air Resources Board hearings on the proposed ambient vinyl chloride standard, May 24, 1978

Testimony, Occupational Safety & Health Administration hearing on the proposed standard for identification, classification and regulation of toxic substances posing a potential carcinogenic risk, June, 1978

Chemical Industry Institute of Toxicology, second CIIT conference on toxicology, Scientific considerations in monitoring and evaluating toxicological research, Feb. 28, Mar. 1,2, 1979

National Academy of Sciences, Committee on Water Treatment Chemicals, Toxicology Subcommittee, member 1981-1983 (Toxicology Consultant)

IISRP, committees and subcommittees on toxicology and industrial hygiene 1978-present

Professional Activities (con't)

Manuscript Reviewer, Archives of Environmental Contamination & Toxicology, 1983-1984

Manuscript Reviewer, J. Fire Sciences, 1985-1988

Testimony before state and local agencies, code groups, and judicial bodies on combustion toxicity of PVC, 1982-present

Workshop on volatile organic chemicals, toxicology group (invited participant) sponsored by EPA under auspices of the American Water Works Assoc. Research Foundation, June 1982

Internationales Kollogrum "Polyurethane in der Medizin-Technik," Stuttgart, W. Germany, Jan. 1983

Gordon Research Conference on Chemistry and Toxicological Aspects of Combustion Products, Aug. 1983

Vinyl Institute Medical Committee Chairman and project monitor, 1985-present

International Symposium on 1,3-Butadiene, April 12-13, 1988, Participant and manuscript reviewer for publication in Environ. Health Perspectives

Professional Honors:

National Institute of Environmental Health Post-Doctoral Fellowship, awarded June 1975

Sigma Xi

Publications:

R.K. Hinderer and R.E. Menzer (1976). Comparative enzyme activities and cytochrome P-450 levels of some various rat tissues with respect to their metabolism of several pesticides. Pesticide Biochemistry and Physiology 6:148-160.

R.K. Hinderer and R.E. Menzer (1976). Enzyme activities and cytochrome P-450 levels of some Japanese quail tissues with respect to their metabolism of several pesticides. Pesticide Biochemistry and Physiology 6:161-169.

H.M. Bolt, J.G. Filser and R.K. Hinderer (1978). Rat liver microsomal uptake and irreversible protein binding of 1,2-^{14}C vinyl bromide. Toxicol. and Applied Pharmacol. 44:481-489.

R.K. Hinderer (1979). Toxicity studies of methylcyclopentadienyl manganese tricarbonyl (MMT). Journal of Amer. Ind. Hygiene Assoc. 40(2):164-167.

Publications (con't)

R.K. Hinderer (1980). Banbury Report 5, ethylene dichloride: a potential health risk? Summary, Cold Spring Harbor Laboratory, pp, 343-345.

R.K. Hinderer, M. Knickenbacker and F.J. Koschier (1982). Mutagenic evaluation of two rubber accelerators. Toxicol. Applied Pharmacol. 62(2):335-341.

R.K. Hinderer, B. Myhr, D.R. Jaggennath, S.M. Galloway, S.W. Mann, J.C. Riddle and D.J. Bursick (1983). Mutagenic evaluations of four rubber accelerators in a battery of in-vitro mutagenic assays. Environ. Mutagenesis 5(2):193-215.

E.G. Leighty and R.K. Hinderer (1984). N-N^{14}C-dinaphthyl-P-phenylene diamine metabolism in the Rhesus monkey. J. Amer. College Toxicol. 3(1):43-56.

R.K. Hinderer (1984). A comparative review of the combustion toxicity of polyvinyl chloride. J. Fire Sci. 2:82-97.

R.K. Hinderer (1985). Limitations of using combustion toxicity for product selection. J. Vinyl Technology, March, pp. 1-7.

R.K. Hinderer, G.R. Lankas, and C.S. Aluetta (1986). The effects of long-term dietary administration of the rubber accelerator, N-oxydiethylene thiocarbamyl-N-oxydiethylene sulfenamide, to rats. Toxicology and Applied Pharmacology 82:521-531.

R.K. Hinderer and H.L. Kaplan (1986). Assessment of the inhalation toxicity of hydrogen chloride gas to man. Dangerous Properties of Industrial Materials, March/April, pp. 2-4.

H.L. Kaplan, A. Anzueto, W.G. Swetzer, R.K. Hinderer (1986). Respiratory effects of hydrogen chloride in the baboon. The Toxicologist 6(1):52.

A. Anzueto, W.G. Switzer, H.L. Kaplan, R.K. Hinderer (1987). Long-term effects of hydrogen chloride on pulmonary function and morphology in nonhuman primates. The Toxicologist 7(1):192.

A. Anzueto, W.G. Switzer, R.K. Hinderer (1987). Acute respiratory effects of inhaled polyvinyl chloride (PVC) smoke in nonhuman primates. The Toxicologist 7(1):207.

H.L. Kaplan, R.K. Hinderer, A. Anzueto (1987). Extrapolation of mice lethality data to humans. J. Fire Science 5(3):149-151.

R.K. Hinderer, B.Y. Cockrell, S.M. Debanne, P.T. Goad (1987). Male reproductive assessment of the rubber accelerator, N-oxydiethylene thiocarbamyl-N-oxydiethylene sulfenamide, in rats. Fundamental and Applied Toxicology 9:763-772.

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Publications (con't)

H.L. Kaplan, A. Anzueto, W.G. Switzer, R.K. Hinderer (1988). Effects of hydrogen chloride on respiratory response and pulmonary function of the baboon. J. Toxicology and Environmental Health 23:473-493.

Career Experience

a. Jointly sponsored studies under trade association umbrella. Sponsoring companies volunteered staff people to be members of a technical panel and/or subcommittees. The technical panel usually was composed of people with health, analytic, regulatory, legal and product use backgrounds. When toxicology studies were contemplated, a toxicology subcommittee was formed to determine what studies were needed, to develop the protocols, to monitor the study and make interim decisions, to review the data and final report, and sometimes to audit the study. The following table provides further details of these projects.

Chemicals	Toxicology Studies	Aspects of Personal Participation	Other Toxicologists and Scientists worked with*
Hydrogen chloride/ polyvinyl chloride	Pulmonary function, deposition, animal model studies of rodents and primates	1	Dr. H.L. Kaplan Dr. A. Anzueto
Butadiene and Styrene/butadiene rubber (SBR)	Inhalation chronic toxicity/cancer bioassay, teratology SBR worker mortality	1	Dr. Robert Scala Dr. E. Loser (Bayer) Dr. C. Johnson (occup. physician) Dr. Matinowski (epidemiologist/Johns Hopkins)
Ethylene dichloride	Inhalation chronic toxicity/cancer bioassay, single generation reproduction via inhalation, metabolism, pharmacokinetics/macromolecular interaction, teratology	1	Dr. C.D. Kary, Dr. Henry Serman, Dr. C. Maltoni, Dr. R.H. Retiz Dr. P.G. Watanabi

1 Major involvement in all aspects of the studies as mentioned in above paragraph 2a.
2 Major involvement in initial phase of program.
3 Major involvement in the final review process
* not necessarily an all-inclusive list

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Career Experience (con't)

Chemicals	Toxicology Studies	Aspects of Personal Participation	Other Toxicologists and Scientists worked with*
Vinyl chloride	Inhalation chronic toxicity/cancer bioassay, worker mortality study, clinical diagnostic parameters	1	Dr. T.R. Torkelson Dr. C.D. Kary Dr. W.M. Busey (pathologist) Dr. G.K. Hatfield Dr. C.H. Tamburro (occup. medicine)
Trichloroethylene	Inhalation chronic toxicity/cancer bioassay	2	Dr. K. Olsen Dr. T. Benza Dr. W.M. Busey (pathologist)
Vinylidiene dichloride	Inhalation chronic toxicity/cancer bioassay	3	Dr. Jerry Smith Dr. J.M. Norris
Epichlorohydrin and allyl chloride	Subacute inhalation	2	Dr. J.F. Quast Dr. C.D. Kary Dr. J.A. John

1 Major involvement in all aspects of the studies as mentioned in above paragraph 2a.
2 Major involvement in initial phase of program.
3 Major involvement in the final review process
* not necessarily an all-inclusive list

b. I have also been involved in numerous studies where I have been one of the principle investigators including, in many cases, direct hands on involvement. In some cases a generic name is given because of potential proprietary considerations.

Chemical(s)	Nature of Study
Alpha Olefin Sulfonates and sultones, substituted norbornenes, substituted amines (alkyl and amyl), substituted aromatics and many others	Guinea pig sensitization using Magnusson and Kligman techniques and Buehler method
Alpha Olefin Sulfonate	Skin painting study
MnO_4	Chronic inhalation study
Chloro, nitro phosphite	Subacute/respiratory effects
Vinyl Bromide	Long-term inhalation chronic toxicity/ cancer bioassay

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Career Experience: (con't)

Alkyl benzene	Metabolism studies to explore possible antidote
Isonizid derivative	Studies to explore possible antidote
Polymerized 1,2-dihydro-2,2,4-trimethylquinoline	Long-term chronic toxicity/cancer bioassay via dietary administration to rats, intratracheal instillation in hamsters and dermal application to mice
N-oxydiethylene thiocarbamyl-N-oxydiethylene sulfenamide	Long-term chronic toxicity/cancer bioassay: dietary administration to rats (in progress)
N-oxydiethylene sulfenamide	Electron microscopic evaluation of testicular structure: Leydig cells, Sertoli cells, germ cells, etc. as prescreen for possible reproductive effects part of long-term dietary study
Sulfenamide rubber accelerator	Male reproductive study, 56 day dietary feeding including EM of tests (in progress)
Polymers	Combustion toxicity using methods recommended by NBS ad hoc group
Complex alkylated piperazinone	Subacute dietary feeding
Others: 50 to 100 general and specialized industrial chemicals, rubber and polymer chemicals (antioxidants, antiozonants, accelerators), and polymeric materials; also organometal compounds	1. *in vitro* mutagenic/carcinogenic screening using Ames, Mouse Lymphoma L5178Y, *E. coli* WP$_2$ uvr A-, *E. coli* pol A+/pol A- (plate and suspension), BALB/3T3 cell transformation and CHO aberration assays 2. Acute oral, dermal, inhalation toxicity evaluations 3. Skin and eye irritation evaluations 4. Aquatic toxicity: fish LD_{50}, *Daphnia* reproduction, algal inhibition

Robert K. Hinderer

Current Position Description

As Manager of Toxicology Dr. Hinderer is responsible for developing, managing and implementing toxicology programs and for providing guidance in policy development and program coordination. He also provides technical oversight of world-wide Corporate and Divisional needs and activities in the human and environmental health areas. Dr. Hinderer is active in the development and analysis of toxicological data for assessing human/environmental effects and meeting new and existing regulatory requirements for both old and new products. Based on this information, he provides guidance to Corporate and Divisional personnel regarding the toxicological implications of products and raw materials.

DERMATOLOGY

By

DONALD M. PILLSBURY, M.A., D.Sc. (Hon.), M.D.

Professor and Director of Department of Dermatology, University of Pennsylvania School of Medicine; Onetime Chairman, Subcommittee on the Cutaneous System and Member of the Committee on Medicine and Surgery, National Research Council; Member of National Advisory Health Council, United States Public Health Service; Director, Commission on Cutaneous Diseases, Armed Forces Epidemiological Board

WALTER B. SHELLEY, M.D., Ph.D.

Associate Professor of Dermatology, University of Pennsylvania School of Medicine; Chief of Dermatology Clinic, Hospital of the University of Pennsylvania; Member, Subcommittee on the Cutaneous System, National Research Council; Area Consultant, Dermatology, Veterans Administration

ALBERT M. KLIGMAN, M.D., Ph.D.

Associate Professor of Dermatology, University of Pennsylvania School of Medicine; Associate Professor of Dermatology, University of Pennsylvania Graduate School of Medicine

W. B. SAUNDERS COMPANY

Philadelphia London 1956

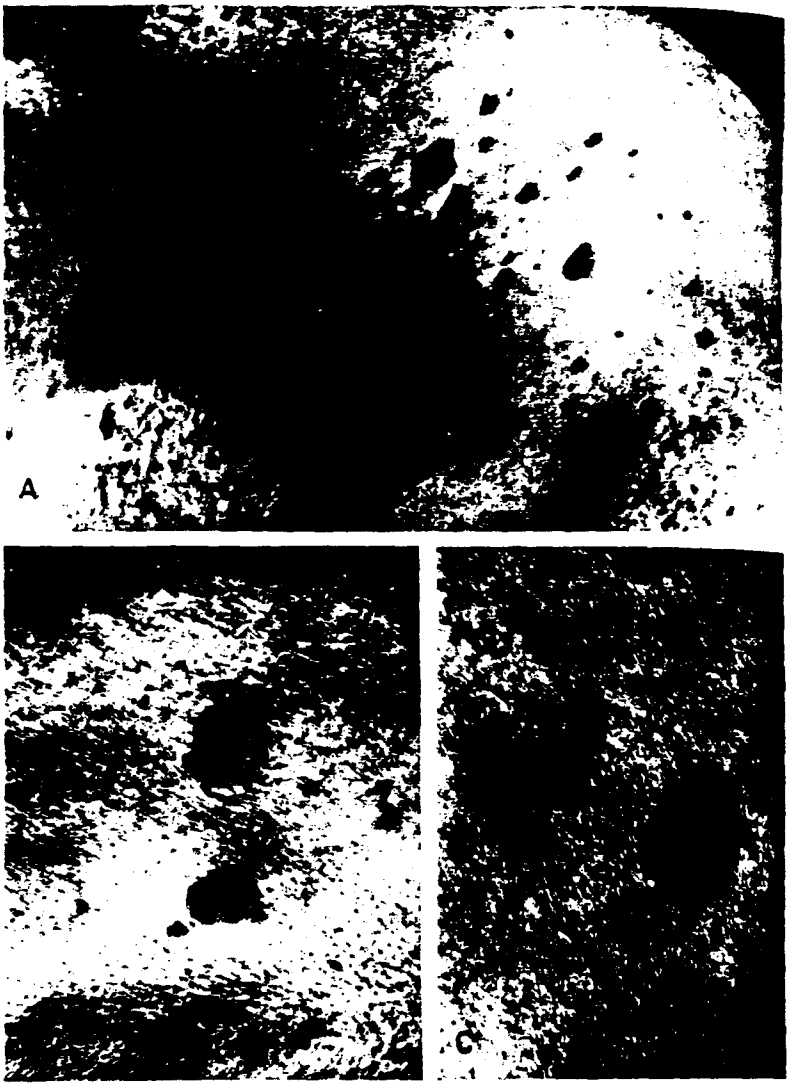
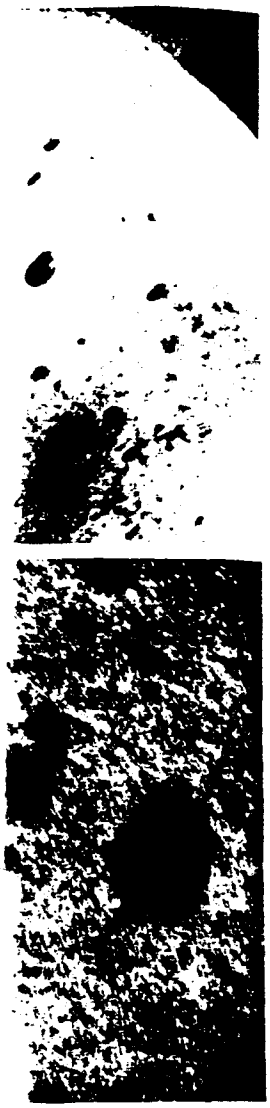


FIGURE 520. Seborrheic keratoses. All phases of evolution are seen.

described as a squamous cell carcinoma, grade one-half. As such, it is not a benign lesion and is discussed elsewhere.

Seborrheic Keratosis

This is the term most generally accepted for this benign noninvasive tumor of epidermal origin, which is characterized by hyperplasia of the keratinocyte, the basic epithelial cell of the epidermis. The lipid-laden keratin often confers a



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distinctly greasy appearance and "feel" to the surface of early lesions. Older hyperkeratotic lesions, however, may become dry and rough. The qualifying adjective "seborrheic" refers to the oily appearance of the lesion rather than to any relation to seborrheic dermatitis or to the sebaceous glands themselves. The term verruca should be applied only to warts of viral origin. A genetic predisposition to seborrheic keratoses is often seen, though the lesions characteristically do not develop until middle age or later.

Seborrheic keratoses ordinarily develop as small yellowish or brownish sharply marginated lesions, slightly raised, and covered by a thin greasy scale. The initial lesion has been likened to the appearance of a drop of rather dirty candle wax on the skin. Multiple lesions are the rule, and some lesions enlarge faster than others. The average size is probably of the order of 1 cm., but individual lesions may enlarge to 2 or 3 cm. in diameter, or this appearance may be brought about by coalescence of lesions. The pigmentation and hyperkeratosis gradually increase, and the lesions become dark brown to black in color. Not infrequently the scale may flake off, particularly in areas subject to rubbing, but it almost always recurs promptly. In a few instances we have observed complete spontaneous disappearance of a seborrheic keratosis.

Seborrheic keratoses occur mainly on the trunk, particularly the shoulders, and on the scalp and face. Lesions may be seen on the upper portions of the extremities and occasionally on the genitalia, but are uncommon elsewhere. We have not observed them on the palms and soles. Exposure to sunlight is not a factor in the onset of the lesions, but after they have developed this tends to increase the keratotic reaction, possibly coincident with the generally heightened cellular activity of such skin. If the skin of the area is affected by a chronic inflammatory reaction, e.g., exfoliative dermatitis, seborrheic keratoses become much larger and more prominent. The surface of older lesions appears granular or pitted, because of keratinous plugs.

The diagnosis of seborrheic keratoses ordinarily presents little difficulty, but in older lesions, confusion with heavily pigmented nevi or with melanocarcinoma may arise. This is easily resolved by punch biopsy, and curettage of the lesion will promptly demonstrate its very superficial epidermal friable character. There is little difficulty in differentiating the lesions from senile keratoses, which are not greasy, tend to be grayish rather than dark in color, are ordinarily smaller, and have a hard keratotic surface. Senile keratoses frequently have a zone of erythema at the base, which may represent either inflammation or early anaplastic changes; this is not seen in seborrheic keratoses unless the lesion has become inflamed or irritated.

A special variant of seborrheic keratosis, *dermatosis papulosa nigra*, occurs principally in Negroes. These lesions present a histologic picture identical to that of seborrheic keratoses. The process develops at or about the age of puberty, in the form of multiple miliary pigmented papules on the upper lateral aspect of the cheeks as a rule, but occasionally more widely on the face and neck. The individual lesion rarely reaches a diameter larger than 5 mm. The surface is smoother than in typical seborrheic keratoses, and keratotic plugging is not grossly marked. Clinical differentiation from flat warts or from small pigmented nevi may sometimes be rather difficult.

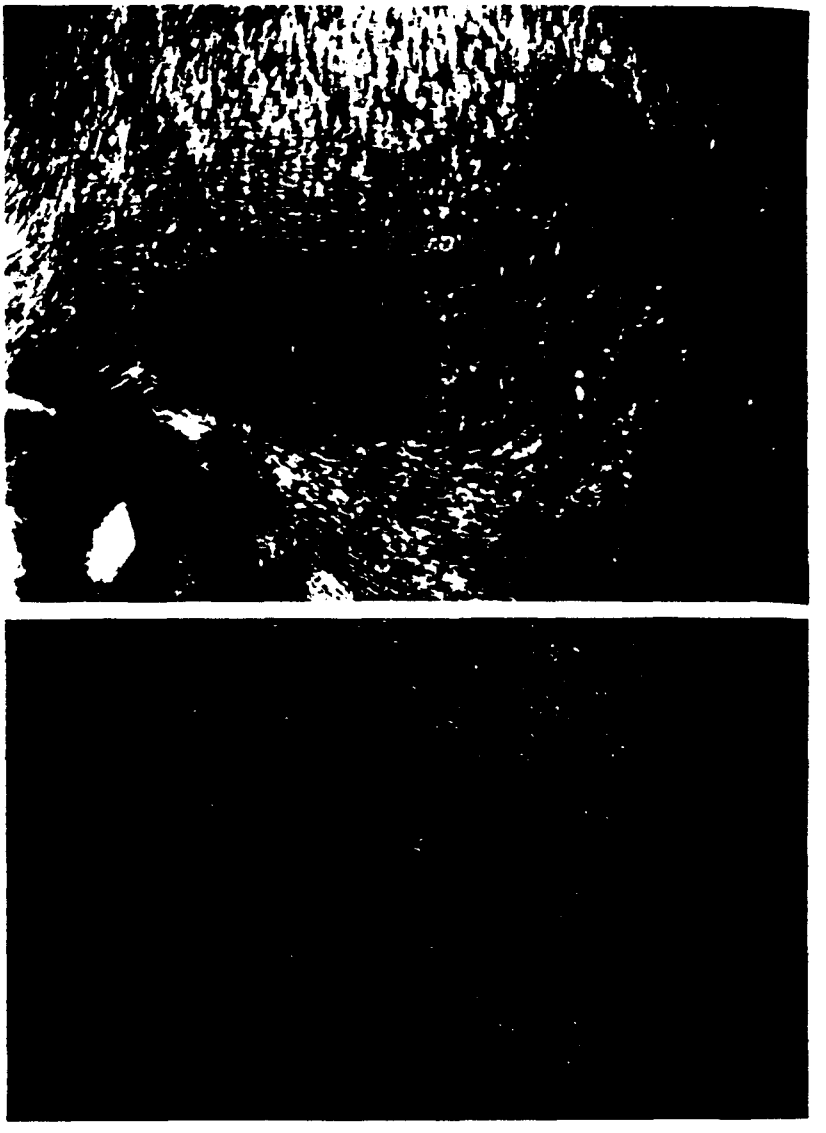

FIGURE 521. Darkly pigmented lesions.
A. Typical benign seborrheic keratoses of scalp. *B*. Melanoma of buttock.

Seborrheic keratoses are not premalignant lesions. Though basal cell epithelioma has been described as occurring in them, we doubt that the lesion is more subject to this tumor than is the surrounding skin.

TREATMENT. Since seborrheic keratoses are superficial epithelial lesions, their removal is simple, and may ordinarily be accomplished with little or no resultant scarring. Lesions of the scalp may be removed without hair loss. The most widely used and simple method is electrodesiccation under local anesthesia. All that is necessary is to sear the top of the lesion gently with the monopolar electrodesiccating spark, scrape the softened tissue off with a curette, and go over the surface of the lesion with a very light spark. If the lesions are very keratotic, it may be advisable to scrape this tissue away prior to desiccation. If there is the

d lesions.

B. Melanoma of buttock.

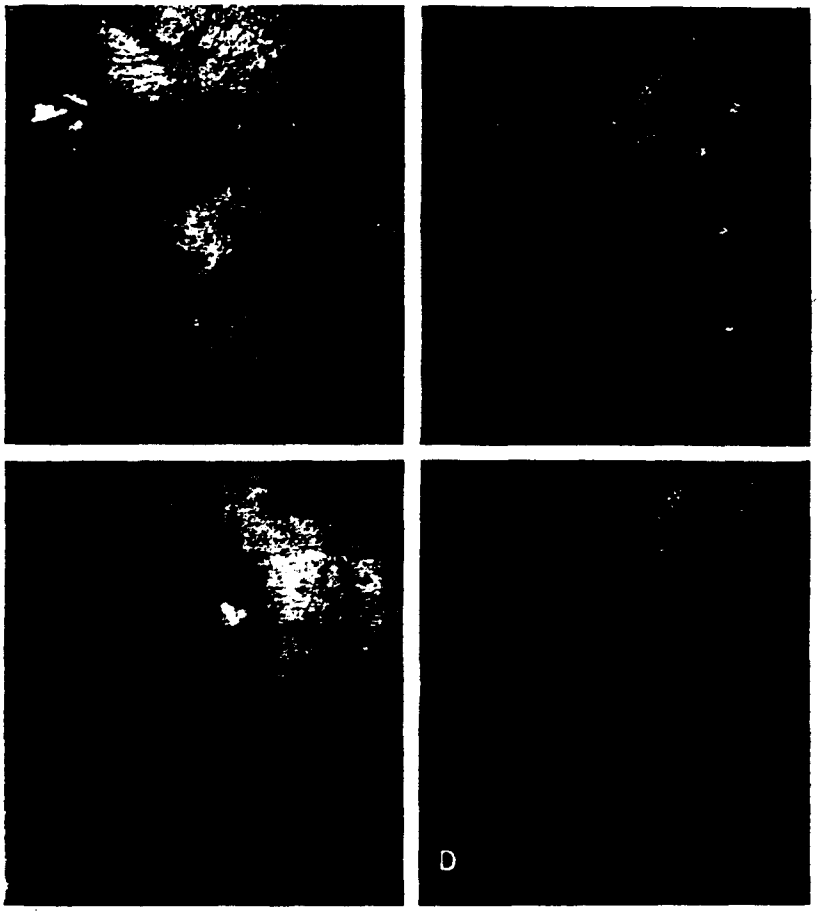

FIGURE 522. Examples of benign tumors.

A. Dermatosis papulosa nigra. A common type of small seborrheic keratoses peculiar to Negroes. *B.* Nevus comedonicus. A rare variant of epidermal nevus. *C.* Sebaceous cyst. *D.* Syringoma, typical location. An uncommon lesion.

slightest question as to the diagnosis, a 5 mm. punch biopsy of the full thickness of the skin should be taken initially. On subsequent curettage of the lesion, however, its superficial and characteristic nature will become apparent. In the case of very large seborrheic keratoses, particularly in cosmetically important areas, it may be advisable to remove the lesion piecemeal in two or three sessions. The reason for this is that if an area of 2 to 3 cm. in diameter is desiccated even lightly, healing may be much slower than in smaller lesions. The site should remain uncovered, though a light dressing may be necessary on areas which are rubbed by clothing. The patient should be instructed not to allow the area to become wet for four or five days, at least.

Surgical excision of seborrheic keratoses is not justified, except possibly in the case of lesions in which there is some doubt as to the diagnosis, and an excision biopsy is desired. Light dermabrasion, using the apparatus designed for removing acne scars, may be employed for multiple lesions. Freezing and various cauterants have been used, but they are less certain and less precise in their action.

Seborrheic keratoses need not be removed on the basis of purely medical considerations. However, they sometimes become very objectionable cosmetically, or may be so raised as to be irritated by clothing or, if in the scalp, by combing and cutting the hair. Lesions of the scalp may be removed without any resultant alopecia, because the hair follicles are far below the depth of removal. The characteristic lesion occurring in Negroes, dermatosis papulosa nigra, should rarely be treated, both because the lesions are not particularly significant cosmetically, and because of the possibility of keloidal scarring.

Seborrheic keratoses are by far the most common tumor of the skin in persons of middle age or above. The patient ordinarily regards the lesion as a "mole," and immediate assurance as to the completely benign nature of the lesion may ordinarily be given after inspection. We have observed many instances of medical error in the interpretation of these lesions, with surgical excision which was unduly deep and wide. X-ray therapy for such lesions is not justifiable, because it must be given in large doses to produce regression, and this will be followed by some atrophy.

Epithelial Nevi

At the outset, it should be understood that these tumors are not composed of nevus cells (melanocytes) and, in fact, were not the term "nevus" so strongly entrenched by usage, we should prefer to abandon it altogether. A wide variety of terms has been applied to such lesions, including keratotic nevus, nevus verrucosus, nevus unius lateralis, linear nevus, and ichthyosis hystrix, reflecting diverse appearances and morphologic variations, though the histologic pictures of all of these are similar. These lesions are congenital, ordinarily appearing at birth or during early childhood, but sometimes being delayed. They may appear on any portion of the skin surface, but show some predilection for the flexor surfaces over joints. They vary widely in appearance, size, and distribution, being large or small, isolated or grouped, and of normal skin color, gray or dark brown. The lesions are ordinarily hairless. Single or multiple lesions may be present, but they are usually multiple.

Multiple lesions are characteristically arranged in a bandlike or linear pat-