

WHAT HAS THE SKIN GOT TO DO WITH IT?

BY

YETUNDE M. OLUMIDE



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U. L. ARCHIVES

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University of Lagos, 2004.

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Introduction

It is a matter of ecstatic joy for me today to deliver this inaugural lecture thirteen years after my appointment to the Chair in the Department of Medicine of the University of Lagos. I deliberately did not schedule the lecture earlier than this year because I believed a matter of greater priority was to write relevant textbooks for the younger generation of medical practitioners on whose shoulder our future rests. It is an awesome experience that God has preserved my life to stand before you this day to finally deliver this lecture — a statutory obligation of a professor in a university.

I indeed had no difficulty in the choice of a subject matter for my inaugural lecture because over the decades of my clinical practice and teaching of the subject, I have come to realize that what constitutes “dermatology” is poorly understood even by fellow doctors in the medical profession, and of course by the general public. This is largely so because the subject is rarely taught at the undergraduate level and indeed in several developed countries this is a deliberate policy in the training curriculum as dermatology is regarded as a subject for the postgraduate level only. However, at the stage of our development and because of the avalanche of skin diseases dictated by the socio-economic, cultural and eco-climatic factors in which we find ourselves, we can hardly afford such a luxury of making the subject an exclusively esoteric subject for the specialist.

Hence, the theme — “*What has the skin got to do with it?*” was chosen simply to give a glimpse of what constitutes dermatology or who is a dermatologist. Since there is no provision for a question and answer session at the end of the lecture, I have deliberately included some basic definitions in the text for further clarification which I shall not read during the course of the lecture.

◆ DEFINITION OF DERMATOLOGY AND DERMATOLOGIST

What is dermatology?¹⁻⁴

Dermatology may be defined as ‘the study of the skin and its diseases’ or as ‘the branch of science which treats the skin’; but even these definitions, wide-ranging as they are, fail to convey the immensity of the subject. Dermatologists cannot confine themselves merely to a study of the skin, but must also study internal medicine and the many environmental factors that so frequently cause skin problems.

The sun and ‘anything under the sun’, from the most traditional and ubiquitous substances, such as clothing, food and water to the newest and rarest artificial chemicals, can adversely affect the skin in some

circumstances. The clinical dermatologist must be knowledgeable about these potential environmental hazards, and this will often require a detailed study of the multiplicity of chemicals, plants, animals, parasites, microorganisms, radiation, climatic conditions, etc. to which the skin is exposed. In many cases, the dermatologist will need to obtain exact details of what is involved in the patient's occupation and social habits.

There are critical areas in which dermatology interfaces with general medicine:

- (1) The skin may provide *prima facie* evidence of internal disease, often specifically identified by the skin biopsy. Thus, the skin is often the vital link in the solution of perplexing diagnostic problems in general medicine. The physician must be capable of identifying the changes in the skin that are incidental findings, but that cannot be disregarded during a general physical examination. Physicians cannot know what to overlook unless they are familiar with the spectrum of lesions commonly encountered during the examination of the skin, e.g., (a) the heliotrope swelling of the eyelid in dermatomyositis (Fig. 1) or eruptive pruritic seborrheic keratosis — Leser Trélat sign, (Fig. 2) may indicate the need to search for an internal malignancy e.g. ovarian cancer; (b) the presence of xanthelasma (Fig. 3)—features of hypercholesterolemia, may call for strict dietary restrictions if one were to avoid a major catastrophic cardiovascular disease; (c) a harmless looking spontaneously scarring plaque on the shins - necrobiosis lipoidica (Fig. 4) may call for diabetic screening; (d) what a patient calls “insect bites”— pruritic papular eruption (Fig. 5) may be a veritable sign of HIV/AIDS; (e) what may be regarded an “allergic rash”, may indeed be the exanthem of syphilis (Fig. 6); a baby with a perioral and acral “rash” may be exhibiting the *classical* features of acrodermatitis enteropathica of zinc deficiency (Fig. 7); (f) multiple skin infarcts (Fig. 8) in lupus erythematosus is often a sinister sign of similar lesions in the kidneys; the cause of radiologically identified diffuse lung shadows may be elucidated by observing tumescent tattoo or tribal marks (Figs. 9 & 10); the genesis of epilepsy in a patient may be clarified from the facial lesions of tuberous sclerosis (adenoma sebaceum) - Fig. 11 and (g) a “rash” on the skin may indeed be metastatic cancers e.g. of the breast (Fig. 12).
- (2) Diseases arising in and limited to the skin can be a major cause of disability and discomfort. The general physician does not always appreciate the importance of dermatologic disease and may not refer patients to the dermatologist for appropriate therapy. Too often patients are mismanaged for months or years with oral antibiotics and antimycotics or topical or systemic corticosteroids.



Fig. 1. “Heliotrope” eyelids in dermatomyositis

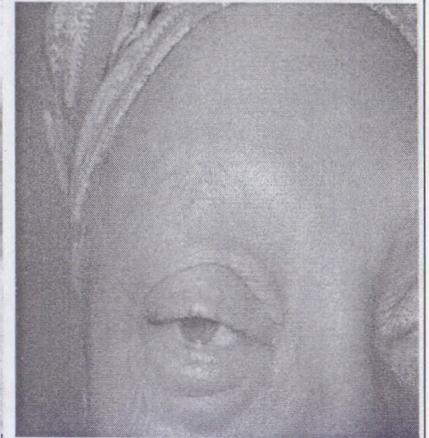


Fig. 3. Xanthelasma



Fig. 2. Leser - Trélat sign



Fig. 4. Necrobiosis lipoidica



Fig. 5. Pruritic papular eruption of HIV/AIDS

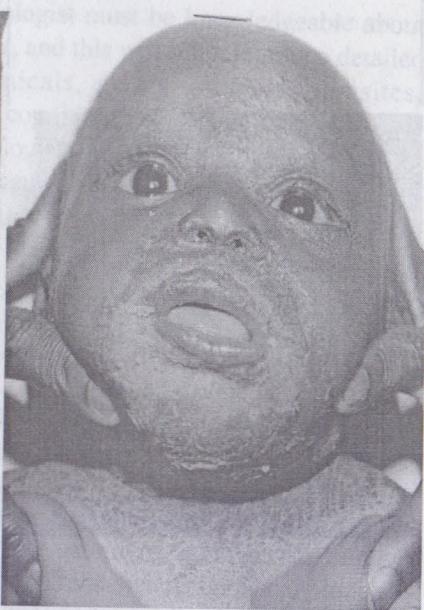


Fig. 7. Acrodermatitis enteropathica in Zinc deficiency



Fig. 6. Syphilitic exanthem



Fig. 8. Systemic lupus erythematosus



Fig. 9. Tumescant tattoo marks and parotitis in sarcoidosis

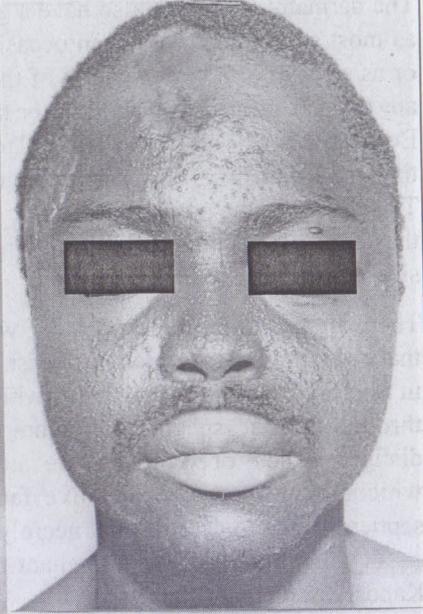


Fig. 11. Adenoma sebaceum

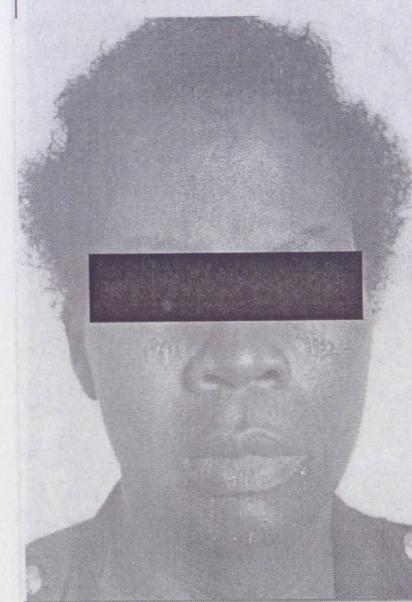


Fig. 10. Tumescant tribal marks in sarcoidosis, note facial palsy



Fig. 12. Metastatic breast cancer

The dermatologist must also have a good knowledge of internal medicine, as most systemic diseases can occasionally affect the skin, either directly or as a result of a complication of the disease or its treatment. Certainly, any drug taken by the patient has to be taken into account by the dermatologist. Because many drugs have a particular tendency to produce a skin problem, the subject of drug reactions is enormous and is continually increasing. The advent of the powerful systemic therapies for skin disease means that the dermatologist must also be ever vigilant for the development of systemic side effects.

There are probably, at least, 2,000 (two thousand) different skin conditions that might present to the dermatologist. The conditions seen vary enormously in severity from trivial problems, which are only of cosmetic significance, through a broad spectrum of acute or chronic diseases, which may be disfiguring, itchy or painful, but are rarely fatal, to life-threatening conditions, which, if untreated, may prove fatal within days (e.g. streptococcal septicaemia or toxic epidermal necrolysis (Fig. 13), weeks (e.g. pemphigus — Fig. 14), months (e.g. malignant melanoma — Fig. 15) or years (e.g. Kaposi's sarcoma — Fig. 16).



Fig. 13. Toxic epidermal necrolysis



Fig. 14. Pemphigus



Fig. 15. Malignant melanoma

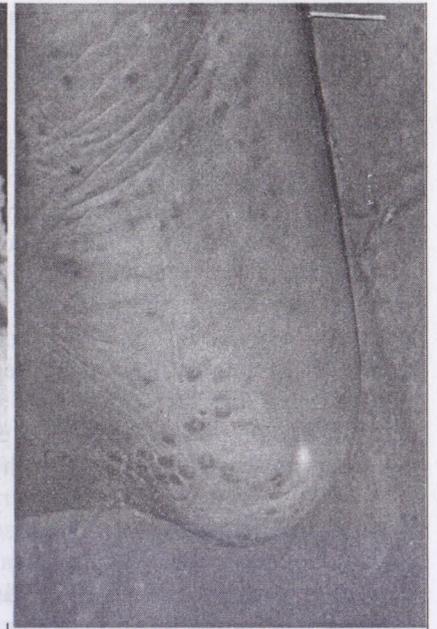


Fig. 16. Kaposi's sarcoma

Skin diseases often bear unfamiliar Latin or Greek names and the nonspecialist is baffled by the complexity of knowing what can be overlooked. The task for the teacher and student is to concentrate on those skin signals of common treatable skin diseases and on lesions that are manifestations of general medical problems. Skin signs cannot suitably be regarded as isolated local phenomena, for they are often evidence of diseases that may hold serious implications for the patient. Certain skin lesions are as important and specific as the discovery of palpable lymph nodes.

Human suffering can arise from disability, discomfort (pain or intractable pruritus), or disfigurement. Skin disorders, involving all three of these, have multiple etiologies and figure much more prominently in human suffering and economic loss than is generally recognized. A survey has revealed that every fifth patient consulting a general practitioner does so because of a skin problem.

Cosmetologic awareness of skin can be generally appreciated from the overwhelming concern of the public with hair colour, hair adornment or its removal, the use of perfumes and deodorants, and cyclic hair fashions. Sometimes the disfigured are neglected and isolated. The relegation in the past, of the dermatologic ward to some sequestered part of the hospital is one expression of the general aversion, even by physicians, to the unaesthetic

nature of skin diseases. The seriousness of disfigurement, however, is best appreciated by the disfigured. The skin of the face comprises only 9 percent of the total skin surface, yet is our "passport" to society. It cannot be covered easily or disguised.

For the practising dermatologist, an awareness of the interaction of emotional conflict and disease states of the skin is as important as a thorough knowledge of the dermatologic pharmacopeia. The doctor's office provides a climate of tolerance in which everyone can say what is often unspeakable at home. It is also true that many patients will talk to the doctor, but not the mental health expert. Many patients find referral to a mental health expert "offensive" or even "insulting"; it is helpful for others. Tentative preliminary exploration of the patient's feelings regarding referral is helpful.

Finally, dermatology encompasses clinical dermatology, dermatopathology, clinical research, evidenced-based medicine, outcomes research, epidemiology, and health care. It encompasses preventive dermatology, dermatology, dermatosurgery, the dermatosciences, and appearance-based dermatology. Clinically, it encompasses general dermatology, occupational and contact dermatology, photodermatoses, leprology, Psycocutaneous dermatology, and genitourinary medicine (venereology). The goals are improved health care, therapy, and prevention, but this is an enormous field and, therefore, difficult to cover. The prerequisites are a scientific-base, the command over a considerable amount of work power, and financial resources.

The skin can be used to ascertain the fundamental mechanism of diseases, in as much as it is the most accessible solid tissue. With regard to immunologic diseases, biopsy of the skin may define the critical antigen, as occurs in hepatitis B-associated polyarteritis nodosa, or in a rheumatologic disorder such as systemic lupus erythematosus.

The skin is a readily accessible organ, hence the prevalence of communicable diseases in a community is a veritable index of the health care status in a community. Owing to the curious predilection for infectious diseases to present with changes to the skin, dermatologists have often played the role of beacons of epidemics and have pioneered characterizations of various pandemics.⁵

Who is a dermatologist?

A dermatologist is a physician who has expertise in the diagnosis and treatment of children and adults with benign and malignant disorders of the skin, mouth, external genitalia, hair and nails, as well as a number of sexually transmitted diseases. Dermatologists have extensive training and experience in the diagnosis and treatment of skin cancers, melanomas, moles, and

other tumours of the skin, contact dermatitis and other allergic and non allergic disorders, and in the recognition of the skin manifestations of systemic (including internal malignancy), and infectious diseases. The dermatologist also has expertise in the management of cosmetic disorder of the skin—esthetic medicine lifestyle services.

The specialist dermatology training in Nigeria is fashioned after the British system. In Nigeria, trainee dermatologists are expected to have completed three years of general postgraduate professional training and to have passed a postgraduate examination in general medicine before they can start their specialist training in dermatology.

With this background and knowledge, dermatologists are singularly qualified to diagnose and treat the wide variety of dermatologic conditions as well as benign and malignant skin tumours. Dermatologists also have expertise in the care of normal skin and in the prevention of skin diseases and skin cancers.

Dermatologists perform many specialized diagnostic procedures including microscopic examination of skin biopsy specimens, immunological methods, cytological smears, patch tests, phototests, potassium hydroxide (KOH) preparations, fungus cultures and other microbiologic examination of skin scrapings and secretions. In addition, the application of modern sophisticated laboratory techniques, such as immunofluorescence, electron microscopy, immunoenzyme methods, *in situ* hybridization, polymerase chain reaction, etc. has offered new insights into dermatologic research and diagnosis. Treatment methods used by dermatologists include topical (externally applied), injected, and internal medications, selected x-ray and ultraviolet light therapy, and a range of dermatologic surgical procedures. The training and experience of dermatologists in dermatologic surgery include electrosurgery, cryosurgery with the use of freezing surgical units, laser surgery, curettage, nail surgery, biopsy techniques (punch and incisional), and excisional surgery with appropriate closures, including flaps and grafts. Among some of the techniques used by dermatologists for the correction of cosmetic defects are dermabrasion, chemical face peels, hair transplants, injections of materials into the skin for scar revision, sclerosis of veins, and laser surgery of vascular lesions of the skin, including certain birth marks.

Dermatologists function according to "The Seven Pillars of Quality." The seven relevant quality areas for physicians: (1) *efficacy*: the ability of care to improve health; (2) *effectiveness*: the degree of attainment of health care goals; (3) *efficiency*: obtaining the greatest improvement at the lowest cost; (4) *optimality*: balancing costs and benefits; (5) *acceptability*: meeting customer preferences in all aspects of health care delivery; (6) *legitimacy*:

conforming to societal preferences; and (7) *equity*: fair access and distribution of health care resources. Dermatologists, as do all physicians, function in all of these areas.

Where dermatoscientists and academicians are going⁶⁻⁸

Dermatosciences is being determined by the avenues the biomedical revolution has opened. Functional genomics, pharmacogenomics, proteomics, gene manipulation, DNA microarray, nanotechnology, or tissue engineering are available and will be used. Tissue engineering is the application of the principles and methods of engineering and the life sciences toward the development of biological substitutes to restore, maintain or improve function. However, the essence of tissue engineering is the use of living cells together with natural or synthetic extracellular components.

Dermatology is involved in the ongoing, basic-science revolution. We are on the threshold of developing vaccines to treat advanced cancers; of dealing with genetic diseases by using transfer technologies; and, by our growing understanding of the immune system, of overcoming severe chronic diseases and infections.

We, the dermatologists, are in the middle of this and, we are caught at the crossroads between science, technology, biomedical research, medicine, education, health care delivery, and lifestyle services.

We will focus on biology, immunity, and genomics. The new developments will, in addition, permit shifts of focus to areas that were not *doable* in the past: chemoprevention rather than the treatment of cancer; restoration of normal skin structure and function rather than suppression of disease; and replacement and correction of defective gene expression rather than the correction of disease symptoms. We will be using new designer therapies that will include engineered antibodies, antisense nucleotides, and gene-modulating agents. This, in part, is already a reality. Here are three examples: gene-modulating approach to induce remission of melanoma metastases;⁹ engineered antibodies have been selectively targeting memory effector T lymphocytes in the treatment of psoriasis;¹⁰ fusion proteins have been directed against tumor necrosis factor- α , which has been shown to lead to a remission of psoriasis.¹¹

Indeed, the exploitation of the Th1/Th2 balance and cytokine networks has led to a better approach to specifically address inflammatory skin diseases such as psoriasis. Targeted therapies include the use of anti-CD11a, anti-CD80, and, as already mentioned, antitumor necrosis factor- α and leukocyte function-associated antigen 3; many more will be defined. Designer therapies include skin-selective system agents such as the advanced ascomycine

pimecrolimus, which we have shown to down-regulate inflammatory skin disease, such as psoriasis and atopic dermatitis, without being generally immunosuppressive.¹² Designer therapy of the future will include the approach of pharmacogenetic profiling using chip technology.

Stem-cell technology has already shown some promising result for autoimmune disease. It is presently exploited for dermatologic purposes and gene-targeted approaches will be used to correct genetic skin disease; they are already widely used in the treatment of cancer. Vaccines for melanoma, to cite just one example, are widely used and have been shown to induce brisk immune responses;^{13,14} it is hoped they will be used as an allogeneic approach and in an adjuvant setting in the future.

Health care reform is a reality. It favors life-threatening issues over quality-of-life issues. But, then, what is the purpose of lengthening a life without quality?

Medicine traditionally has been most concerned with disease and disorders that end life. Greater attention must be directed to those medical conditions that ruin life without ending it.

Fifty years ago, dermatologists were considered by other medical specialties as external doctors who had many diagnoses, little knowledge of pathophysiology, and whose therapeutic armamentarium consisted of slapping ointments on the skin. This is *not* true. The attitude towards dermatology has changed drastically. Sequestration and aversion were succeeded by a growing concern for skin and esthetic appearance. Our professionalism is on the basis of scientific credibility, on the basis of disease, on the knowledge of mechanisms and treatment of disease, and use of the entire armamentarium science offers. This calls for the recruitment of the brightest and best.

◆ HISTORY OF DERMATOLOGY^{3,15-23}

Hippocrates of Cos was born circa 460 BC and died circa 370 BC in Tessaly. He has become a symbol of the humane, compassionate, skillful practice of medicine. Hippocrates stressed the importance of careful observation in medical practice, an ancient yet modern idea. His observational skills enabled the "Father of Medicine" to describe several dermatologic disorder, such as acne, rosacea, alopecia, anthrax, aphthous ulcers, ecthyma, frostbite, purpura, scabies, thrush, warts, cutaneous tumours, and exfoliative dermatitis. But none of his descriptions of diseases was as important as his emphasis on the idea of close observation.

Hippocrates also espoused the idea that diseases were somatic disorders caused by disturbances within the body and not the result of religious or

supernatural forces. This was a critically important theory that opened the door to a scientific, practical approach to diagnosis and therapy. In Hippocrates' time diagnosis and prognosis were far more developed than therapy. Although Hippocrates and fellow Greek philosopher-physicians initiated several therapeutic concepts of lasting impact (water baths, cosmetics, the topical use of fats and mineral oils, the application of tar for alopecia), their most enduring therapeutic idea was to practice medicine without endangering the patient—*primum non nocere* (first do no harm)! There is no better aphorism to repeat each day before seeing your first patient.

Ideas in the history of dermatology

The quintessential idea in the evolution of dermatology as a specialty is the concept that skin diseases comprise a unique, cohesive family of disorders worthy of abstraction and specialized study. Without this clinical Weltanschauung, there simply could not be a medical specialty called dermatology.

The critical step in establishing this delightfully self-indulgent worldview was the establishment of a uniform, systematic classification of skin diseases. For fifteen centuries, Galen's woefully inadequate classification based on diseases of the hairy and nonhairy parts of the body had dominated dermatologic nosology. The first decisive rejection of Galen's hypothesis was by the Austrian Joseph Jakob Plenck (1738-1807), whose system was a largely Linnean one.

The first practical classification of skin diseases was published as *Doctrina de Morbis Cutaneis* in 1776. Plenck's intellectual transplant was rejected and supplanted by the system of Robert Willan (1757-1812), one of the founders of modern dermatology. Willan's classification stressed localized morphologic features and was published in *On Cutaneous Diseases* in 1808. Willan and his almost indistinguishable pupil-protégé-alter ego, Thomas Bateman (1778-1821), replaced nosologic confusion with a sense of order, a seemingly Sisyphean task. Between them, Bateman and Willan also established the importance of illustrating skin diseases, with Bateman publishing the first dermatologic atlas in 1814. Bateman was Willan's Boswell, and more. Ferdinand von Hebra (1816-1880), the Viennese giant and another "founding father", developed a classification of skin diseases based on pathologic anatomy (1845); this was the best, most comprehensive system to date and soon replaced the Willan-Bateman classification. A good idea's time had come at last.

In dermatology, as in general medicine, an incorrect theory can have a negative impact on intellectual progress. A good example is the ill-fated self-experimentation of John Hunter in 1767. In an attempt to answer the question whether syphilis and gonorrhea were caused by the same organism, he inoculated his penis with pus from a patient suffering from gonorrhea; Hunter did not know that his patient also had syphilis. When signs of both syphilis and gonorrhea developed, Hunter concluded erroneously that both diseases were caused by the same organism and promulgated this belief in his *Treatise on the Venereal Diseases* (1787). Despite treatment with mercurial injections, John Hunter died of syphilitic heart disease in 1893. However, unfortunately his false hypothesis outlived him, surviving until Philippe Ripcord published the results of more than 2500 human inoculation experiments in 1898. Ripcord not only clearly established the concept that syphilis and gonorrhea were distinct sexually transmitted diseases but also delineated and defined the classical primary, secondary, and tertiary stages of lues (syphilis).

Like Galen's humoral theory, Hunter's erroneous tenet endured many years because of his redoubtable reputation. Still we must remind ourselves that even incorrect ideas may be useful. The fate of any hypothesis is to be tested: questions are formulated; experiments are designed; and false gods are ultimately rejected. This is the life cycle of an idea.

Sir Jonathan Hutchinson (1828-1913), another great British physician and Renaissance man, authored yet another fascinating but inaccurate theory. In 1906, Hutchinson published *On Leprosy and Fish-Eating: A Statement of Facts and Explanations*. He wrote that the "cause of the malady known as true leprosy is the eating of fish in the state of commencing decomposition." Although he expended much time and great energy, Sir Jonathan was never able to breathe life and credibility into his theory.

Ideas, whether good or bad, do not simply happen. They do not exist in a vacuum and they do not leap miraculously from uninspired gray matter. Ideas not only have a life cycle, they have a habitat, a milieu. Any given concept may be found deeply embedded in a cultural, social, economic, and political matrix. The history of ideas is deeply concerned with this matrix.

The occurrence can become an idea only if the observer is prepared to appreciate its significance. In the words of Louis Pasteur: "In the field of observation, chance only favours prepared minds."

A dermatologist from Germany, Erich Hoffman (1868-1959) with his colleague Fritz Schaudinn (1871-1906) were the first to demonstrate the organism *Treponema pallidum* in the lesions of secondary syphilis.²¹ In 1905, Schaudinn and Hoffman concluded a long search for the causative

organism of syphilis by identifying the *Treponema pallidum*. They had no new technology, at least none that had not been available to many others for more than a half century, but Fritz Schaudinn knew what to look for. While others were looking in vain for bacteria or fungi, he quickly identified the pale corkscrews of syphilis with trained eyes and a prepared mind.

And so it goes. Conceptualizing is a seemingly endless interplay of technology, observation, and insight. The birth of an idea, like that of a child, is a mysterious and awesome event.

The evolution of dermatology^{3, 5}

It is 200 years since the *first great school of dermatology* became a physical reality and Alibert was entrusted with the directorship of the famous Hôpital Saint-Louis in Paris (1801). The *first textbooks* (Willan's, 1798-1808) and *atlases* (Alibert's, 1806-1814) appeared in print at that time. Skin diseases were described by *individual lesions* (Plenck, 1776), and skin was considered to be an *organ* (Lorry, 1777). Special skin clinics and hospitals were opened.

The *name of the specialty* originated in the form of the (semantically wrong) words *dermologie* (in French, 1764) and, a little later, *dermatologia* (in Latin, 1777). Almost a full century passed before the term *dermatology* was integrated into the various national languages of Europe and was used to identify appointments, departments, and university chairs. Earlier, *diseases of the skin, maladies de la peau, Haut-Krankheiten, malattie della pele,* and the like were standard. *Dermatopathologia* appeared in 1792 but found its proper use only one century later (Unna's book, 1894). Many journals were founded in 1866. *Dermatologic societies* began in 1869 (New York Dermatological Society). The American Dermatological Association (ADA) followed in 1876. The first *International Congress of Dermatology* was held in Paris in 1889. The *International League of Dermatology Societies* was formed in Budapest in 1935 and serves as the governing body of world dermatology.

The history of dermatopathology is a century-long story from the early and prophetic thoughts of Henry Seguin Jackson to the first textbook by Unna the German dermatologist, Unna, was one of the first to provide adequate microscopic descriptions of cutaneous lesions. From 1775 to 1928, the chief contributions were in the field of experimental pathology. The first forays into skin pathology, albeit largely conceptual and semantic, were conducted by Jackson (1792), Gilbert Breschet (1835), and Julius Rosenbaum (1839). The efforts stalled; both the optical instruments and the cutting and staining techniques were not yet sufficiently developed. Full fruition required several more generations and the hard work and talents of Auspitz, Brocq, Darier, Gans, and Lever.

◆ PSYCO CUTANEOUS DISEASES

In 1681, Sydenham described angioneurotic edema in a discussion of hysteric disease.²⁴ Erasmus Wilkinson in his 1857 treatise on 'Diseases of the Skin' made a lot of references to the role of the emotions in skin diseases.²⁵ Subsequently in 1886, Morselli first coined the term dysmorphophobia for the complaint of some physical defect which the patient thought was noticeable to others, although his appearance was within normal limits.²⁶ Driscoll et al, in a discussion of the historical aspects of delusions of parasitosis commented on how Thibierge in 1894 described a condition now called 'Delusion of Parasitosis' as acarophobia.²⁷ Subsequently, it was termed dermatophobia, parasitophobia or entomophobia. In 1896 Perrins,²⁸ reported three cases of parasitophobic neurodermatitis.

Interest in psychocutaneous diseases peaked in the late 1940s and early 1950s, and some textbooks in the subject came into being.²⁹ Eventually during the 1950s and early 1960s, psychosomatic dermatology clinics evolved in Europe and North America where dermatologists, psychiatrists and psychologists collaborate in the management of such patients.³⁰

The role of emotional factors in diseases of the skin is of such significance that if they are ignored, the effective management of at least 40% of the patients seeking dermatological care is impossible.³¹

Writing under the heading *Measurement of health-related quality of life (HRQOL) associated with skin diseases* Balkrishnan et al³² noted that while skin diseases are rarely fatal, they can have tremendous impact on patient's lives. There are several common dimensions or domains of function impacted most by disease. Physical functioning is one of the most fundamental dimensions of health related quality of life (HRQOL) and includes activities like climbing stairs or getting dressed. Somatic sensations like pain, nausea, and pruritus represent another dimension. The psychological dimension includes emotional states like depression, anxiety, and anger and psychological factors such as self-esteem and social hypersensitivity. Social functioning encompasses the quantity and quality of our social interactions. The impact of disease on productive activities such as work or school and on leisure is also important. Skin disease has the potential to impact all these dimensions of HRQOL.

Writing under the title *White patches and bruised souls*, Grimes³³ further expanded on this psychosocial impact of skin diseases. Vitiligo (Fig. 17) is no doubt one of the most psychologically devastating diseases in dermatology. In a society obsessed by appearance, patients are often stigmatized, traumatized, and ostracized. Children are frequently teased and ridiculed by their peers. Adults experience low self-esteem and job discrimination. In India, vitiligo is often considered "white leprosy", and

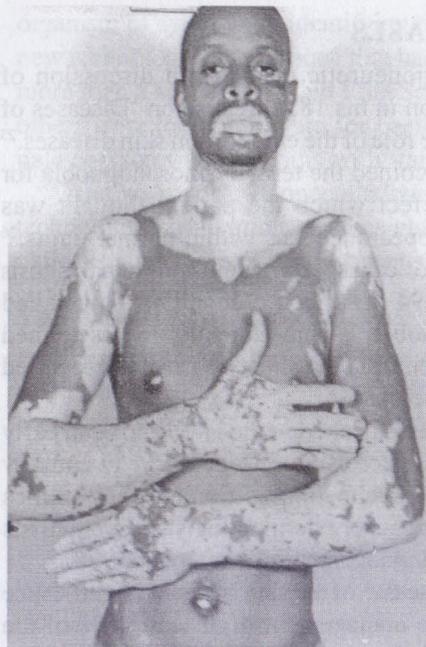


Fig. 17. Vitiligo

the stigma of the disease has major societal implications. It interferes with marriage prospects; it causes marital discord, and divorces are common.

Writing under the heading, "Fighting and living with vitiligo" a patient³⁴ once wrote

"Vitiligo is worse than diabetes. I am a patient who lives with both vitiligo and diabetes, and I can't help comparing them. I know at some point in the future I could die from the physical complications of type 1 diabetes. But in my experience, the deep psychological pain of vitiligo is everyday a more destructive force in my life.....The fact that I was a man who had to use makeup really took a toll. My self-confidence was

shot. Who was going to go on a date with me, much less marry me.....I wanted to run and hide. I thought, Don't let anyone get too close. They may not notice. Yes, this was worse than diabetes. Somehow I could manage the diabetes and conceal it, but vitiligo is worn like a badge, out there for all to see."

Some patients will present in the dermatological setting with psychiatric syndromes. These syndromes may have been present before the physical illness; they may have arisen because of the physical illness or its antecedents or as a reaction to the illness. Patients who are physically ill, whether seriously or not, acutely or chronically, will have an emotional reaction to illness, and will have psychological needs. For the sake of their health these needs must be met. Skin diseases, by virtue of their visibility and often erroneous association with contagion and filth almost always incur emotional reactions which are either abnormal quantitatively or qualitatively.

The recognition of the relationship between the psyche and the soma has a long history. The skin being an organ of touch, temperature and pain sensations, as well as an erogenous zone, has great psychological importance at all ages. It is an organ of emotional expression and a site of discharge of anxiety. Psychopathologically, the skin may be used for the expression of hysterical exhibitionism, for the satisfaction of masochistic impulses, as a

projection mechanism of paranoia and for the expression of displaced libidinal discharge.³¹

The skin is of major importance in our 'body image,' and the fact that skin diseases are often regarded with revulsion by the general population adds to the distress, so that the psychological disturbance induced by skin problems may be out of all proportion to their 'medical' significance. A simple hand eczema may prevent a lady from initiating or responding to a handshake. A visible rash may cost loss of job interview or travel visa. Wedding dates have been postponed or cancelled because of skin rash. Atimes, these psychological problems are fostered by the reactions of the patients relatives, friends or colleagues; and in some cases they are partly induced by feeling of guilt or despondency, induced by the belief that skin diseases are due to 'uncleanliness' of some sort (with or without sexual overtones). Skin disease not only cause stress or depression, but in addition, psychological stress from another cause may exacerbate many skin diseases. Some patients have 'skin problems' that are not apparent to the outside observer (Dysmorphophobia) and the presentation to the dermatologist may be a 'cry for help' with marital or other social problems. In such cases, the dermatologist's role as a psychotherapist may be paramount. In other cases, the dermatological consultation may be a manifestation of an underlying psychological disease such as depression or schizophrenia.

Often the skin disease of the patient is a manifestation of conflict among family members. Treatment that concentrates on the family constellation may cure the patient's skin by indirection.

A number of psychobehavioral techniques (hypnosis, relaxation response, forced imagery) have been found to be effective in decreasing symptoms or reducing the extent of the skin lesions in warts, eczema, and psoriasis, among other conditions.

Emotional stress may give rise to peripheral changes which predispose to injury by physical, chemical or infective agents, or may set in motion a complex of physical and emotional reactions which aggravate or perpetuate existing lesions. Identical skin reactions may be produced in different patients or in the same patient at different times by either emotional or physical factors.

The aetiopathogenesis of this relationship between the psyche and the soma is still not clear. A variety of mechanisms have been postulated, and range from classical Freudian ideas of hysterical conversion mechanisms, to ideas of the skin as an infantile preverbal means of communicating emotions which is brought back into operation at times of regression, or is repeatedly utilized by those who have failed physically or psychologically to develop the languages to express feelings.³⁰ There are also biological theories of specific neurophysiological disturbance underlying these disorders as some

specific neuro transmitters have been identified with pharmacologic agents which have been developed to interact with these neurotransmitters.³⁵

There is evidence which suggests a higher prevalence of psychiatric disorder in dermatology out-patients and in-patients than in any other medical specialty.³⁶ The following factors have been recognized.

- (1) Some psychiatric patients have a defensive need to deny their psychopathology and seek dermatologic care for their visible cutaneous symptoms.
- (2) Psychosomatic mechanisms may precipitate skin disease in predisposed subjects.
- (3) Psychiatrically disturbed patients may present to the dermatologist on account of hypochondriasis, delusions or hallucinations related to the skin or self mutilation.
- (4) Disfigurement, social stigma or some disruption of lifestyle, resulting from skin disease, may precipitate psychiatric symptoms e.g. alopecia areata or severe acne vulgaris may be associated with depression.
- (5) Drugs used to treat skin diseases for instance steroids, may cause psychiatric disturbances, and drugs used in psychiatry e.g. chlorpromazine and lithium may affect the skin.
- (6) Systemic diseases e.g. systemic lupus erythematosus or porphyria may produce both skin lesions and psychiatric disturbances.

The prime importance of these disorders lies in the fact that they are often a source of severe disability, that is to say they will interfere with sleep and appetite and concentration, as well as diminish the ability of the patient to carry out normal functions. There is always an attendant risk of suicide in patients with established, severe psychiatric problems who present to dermatologists.

Even in the paediatric age, lesions which are unsightly or cosmetically disfiguring may profoundly influence the emotional development of a child and may influence the attitude of the mother towards him.

The infant with atopic eczema (Fig. 18) may be unconsciously rejected by his mother who cannot take pride in displaying a beautiful baby. She often feels, and sometimes expresses, guilt concerning her own responsibility for the eczema or her inability to overcome a feeling of revulsion at the sight of the lesions.

The child of school age is often first made aware that he differs from other children by the comments of his school mates, and sometimes by the attitude of his teachers, some of whom still regard all skin diseases as dirty or infectious and treat the child accordingly. Often the child is asked to stay home until he is cured or requested to bring a letter of clearance from the dermatologist that his school mates are not at risk of contacting the skin



Fig. 18. Atopic dermatitis

disease. The child will tend to avoid participation in swimming or in other sports which involve exposing the body.

With the approach of puberty, the presence of disfiguring lesions becomes a source of increasing anxiety to many children, and may greatly handicap them in developing easy and healthy natural relationships with the opposite sex — heterosexual friendships. Some children become increasingly introspective and solitary, others aggressive and uncooperative.

Hence, the presence of any chronic or recurrent skin disease in a child is often a challenge to the dermatologist, who has to make every effort to ensure that any necessary adjustments are made in

the attitudes of parents and teachers, and at times in the attitudes of the medical attendants themselves, while the child is under regular supervision.

Ohuabunwa³⁷ studied a population of 202 adult patients attending the psychiatric out patient clinics of the Lagos University Teaching Hospital (LUTH) and Yaba Psychiatric Hospital. The prevalence of dermatological disorders among psychiatric patients was 73.3%. The most common group of dermatological disorders among the patients were psychocutaneous disorders. Psychocutaneous symptoms preceded onset of other psychiatric symptoms in 37.8% of patients, while the rest had their symptoms starting together with or after other psychiatric symptoms. Most of the patients had delusional dermatological disease. The psychocutaneous disorders included obsessive/compulsive disorders, onychotillomania, neurotic excoriations, trichotillomania, parasitophobia.

In consonance with previous authors, Ohuabunwa advocated liaison between dermatologists and psychiatrists, but that patient should be adequately examined and investigated to exclude any underlying organic condition before concluding that the disorder is psychogenic. A high index of suspicion is also recommended in assessing patients with no apparent skin disease so that any underlying psychopathology can be appropriately and promptly managed.

◆ PHOTODERMATOLOGY

Cutaneous Photobiology³⁸⁻⁴³

Photobiology is the study of the effects of ultraviolet (UV) and visible radiation on living matter. Cutaneous (dermatological) photobiology is concerned with those effects on skin.

Electromagnetic (EM) radiation is a form of energy. When this energy is absorbed by molecules in the skin, photobiologic responses may occur such as sunburn or skin photosensitization.

The regions of interest to photobiologists are the ultraviolet, visible, and near infrared, which are all nonionizing electromagnetic radiation. Wavelengths that cause ionization are studied in radiobiology. Table 1 shows the electromagnetic spectrum. A major source of nonionizing radiation is the sun. Sunlight sustains life; the energy captured in photosynthesis is the ultimate source of the energy content of food. However, sunlight also causes such deleterious effects as mutagenesis and carcinogenesis. Humans benefit from sunlight by synthesizing vitamin D in their skin and sunlight is used by the eye and brain to give information about the environment. In addition to vision, certain animals are affected by sunlight through stimulation of the pineal gland. Physiologic and behavioural responses result, such as endocrine secretion, certain circadian rhythms, and seasonal changes in pelage colour.

Table 1 Classification of EM radiation according to wavelength

Region	Approximate wavelength range
Gamma rays	
X-rays	0.1-100 Å
Vacuum UV	10-200 nm
Ultraviolet C (UVC)	200-290 nm
Ultraviolet B (UVB)	290-320 nm
Ultraviolet A (UVA)	320-400 nm
Visible light	400-760 nm
Near infrared	0.74-1.5 µm
Middle infrared	1.5-5.6 µm
Far infrared	5.6-1,000 µm
Microwaves and radiowaves	> 1 mm

The quantity of ultraviolet radiation (UVR) striking the earth's surface depends on several factors, including the following:

Atmospheric and environmental conditions:

The ozone layer forms a natural shield in the stratosphere that absorbs much of the biologically damaging UV radiation from the sun before it can

reach the earth's surface. Other factors are *time of day*, *altitude*, *season* and *latitude*.

Other sources of ultraviolet radiation

Most people are unintentionally exposed to UVR. Exposure to natural UVR is unavoidable, whereas artificial UVR exposure occurs largely in the workplace.

Prior to the beginning of the last century, the sun was the only source of UVR but, with the advent of artificial sources, the opportunity for additional exposure has increased. Exposure may be intentional, e.g. cosmetic tanning from sun or solarium, sunbathing, and UVR in medicine—for diagnostic and therapeutic applications. However, most people are unintentionally exposed to UVR. Exposure to natural UVR is unavoidable, whereas artificial UVR exposure occurs largely in the workplace. Artificial sources of UVR are used in many different applications in the working environment. Some of the sources of artificial UVR exposure are industrial photoprocesses, sterilization and disinfection, welding, phototherapy, operating theatres, fluorescence in cutaneous and oral diagnosis, polymerization of dental resins, research laboratories, ultraviolet photography, insect traps, sunbed salons and shops, discotheques (UVA 'blacklight' lamps are sometimes used in discotheques to induce fluorescence in the skin and clothing of dancers), offices (signature verification is commonly performed by exposing a signature, obtained previously with a colorless ink, to UVA radiation under which it fluoresces); general lighting—fluorescent lamps used for general lighting in offices and factories emit small quantities of both UVA and UVB.

Biologic effects of UVR

Exposure to UVB and, to a lesser extent, UVA can cause adverse health effects, including **premature ageing of the skin**, increased incidence of **skin cancers, cataracts, and immune suppression**. UVA rays are closest to the visible spectrum, pass through window glass and are least harmful on a dose-for-dose basis. They can produce erythema, tanning, skin ageing, cancer, cataracts, and immune suppression but at doses about 1000 times greater than for UVB. 90% of UVB (290 - 320nm) radiation is blocked by the stratospheric ozone layer, as only about 10% does reach the surface of the earth and has great carcinogenic potential. UVB rays are primarily responsible for nearly all biological effects following exposure to sunlight, namely sunburn, suntan and, after many years, premature ageing of skin and skin cancer. Exposure of the eyes can produce cataracts, photokeratitis and conjunctivitis. It also causes immune suppression. Local suppression

of contact hypersensitivity (CHS) requires only a low dose of UVR and the most effective wavelengths for inducing suppression are < 300 nm. Suppression appears to be initiated by a UV-induced alteration of antigen-presenting (A-P) cell function in the exposed skin. Systemic suppression of CHS requires a much higher exposure dose of UVR in comparison with the dose required to produce local suppression, and the most active wavelengths are around 265-275 nm. The only well established benefit of exposure of normal skin is the production of vitamin D.

Virtually no UVC (200 - 290nm) reaches the earth's surface, because it is absorbed by the stratospheric ozone layer. Nevertheless, UVC is produced by many artificial sources and can be particularly damaging to the eyes.

Pathogenesis of tissue damage

To understand these photobiologic phenomena, it is essential to be acquainted with the physics of radiation and its interaction with matter. The optics of tissue determine how deeply the radiation penetrates. Some of the radiation is absorbed by molecules in the tissue. Only the radiation that is absorbed can initiate a biologic response. The pathway from light absorption to observable biologic effects can be divided into several steps (Fig. 19). In the first step, radiation is absorbed by molecules in skin such as DNA, RNA, proteins (keratin, collagen, elastin), porphyrins, and others. A light-absorbing molecule is referred to as a *chromophore*. Specific chromophores are present for each photobiologic response. After absorbing the energy of the radiation the molecule is in an *excited state*. This highly energetic species exists for only a fraction of a second before losing the energy. A chemical change occurs in the molecule to form a *photoproduct* (step 2). This in vivo photochemistry may result in an observable photobiologic response.

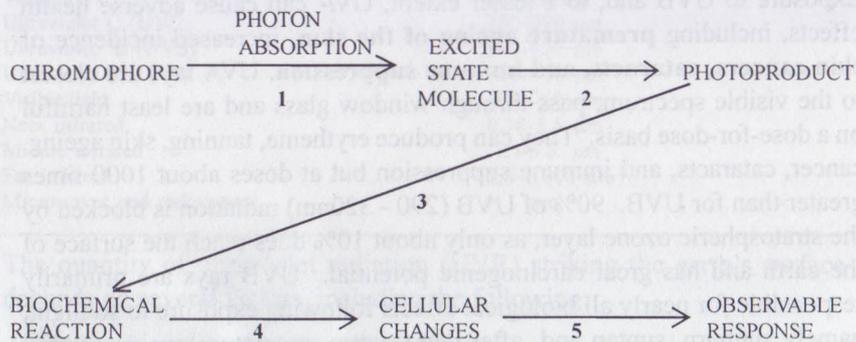


Fig. 19. The pathway from light absorption to observable biologic effects.⁴⁰

Complex biochemical processes are initiated (step 3) such as enzymatic repair, generation of ion fluxes, induction or inactivation of enzymes, initiation of DNA replication, and so on. These biochemical responses culminate in cellular effects (step 4), such as proliferation, mutagenesis, loss of cell surface markers, and toxicity. In the final step, the observable photobiologic effect occurs (step 5): erythema in skin, appearance of hyperplasia or induction of tumor, impaired vision, and many others.

Natural defenses of the skin against radiation

The *stratum corneum*, with its variable melanin content, is a major optically protective element of the epidermis. Stripping the stratum corneum lowers the sunburn threshold. Conversely, areas of the body with thick stratum corneum (palms, soles) are least sensitive to UV radiation.

Melanin is generally regarded as the major defense of the skin against the acute (sunburn) and chronic (aging of skin, keratosis, and skin cancer) effects of sun exposure, protection being directly proportional to degree of melanization, whether constitutive (the individual's genetically determined baseline color) or facultative (ability to tan in response to UV exposure). The photoprotective role of melanin is attributed to the following properties: (a) Absorption of radiation (b) Scattering of radiation and (c) Stable free-radical character.

Other normal epidermal constituents, including urocanic acid, carotenoids, and skin surface lipids, may be photoprotective.

Persons with certain genetic diseases such as albinism in which there is a pigmentary defect, and xeroderma pigmentosum, in which repair of DNA damage is deficient, are at greater risk of developing skin cancers. Furthermore, individuals of Celtic heritage have an ethnic predisposition to skin cancer, although the basis for this susceptibility has not yet been elucidated.

In studies of albinism in Nigeria, no albino over the age of 20 was without premalignant or malignant lesions.^{41,42} Figures 20 & 21 show cancers in albinos.

Since albino skin is predisposed to actinic changes, including nonmelanoma skin cancers, daily protection with UVA and UVB sunscreens is mandatory.

Consequences of a tinner ozone layer^{38-40, 43-47}

Industrialization in the 20th century has been responsible for environmental pollution and ecological damage with serious and unpredictable consequences. The use of chloro-fluorocarbons and nitrogen oxides has led to a depletion of the ozone layer in the stratosphere, which offers a protective shield against

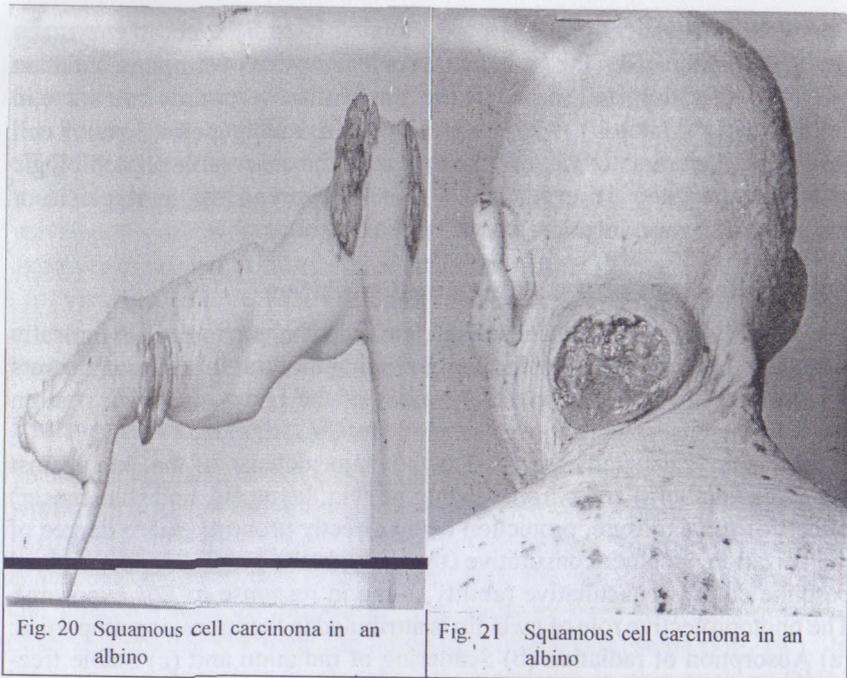


Fig. 20 Squamous cell carcinoma in an albino

Fig. 21 Squamous cell carcinoma in an albino

ultraviolet radiation (UVR). Consequently, the quantity of UVR reaching the Earth's surface has increased alarmingly, enhancing its carcinogenic effect.⁴³

Ozone effectively screens almost all of the most dangerous short-wave UVB, from 290 to 300nm. Under a scenario of ozone depletion, most of the increased transmission of UVR will be short-wave UVB. This results in a disproportionate biologic effect because more biologically active UVB transmission is increased. UVB of 290nm is 1000 to 10,000 times more effective at producing cellular damage than UVR over 330nm. It has been estimated that each 1% decrease in the total ozone column will increase the biologically effective UVB 1.3% to 1.5% based on the McKinlay and Diffey erythema action spectrum. If no controls are instituted on CFC production and release into the atmosphere, an overall 40% decrease by 2075 has been predicted. Even if serious ozone depletion occurs, transmission of UVC, which would be disastrous, is unlikely. UVC is screened effectively by minimal amounts of ozone and under 240nm by doublet oxygen. A thinner ozone layer makes little difference to UVA transmission because it is only slightly affected by ozone.

Of great concern is possibly serious worldwide biologic effects, including the killing of ocean plankton and decreased crop production.

If more short-wave UVB is transmitted, there may be an increased number of *skin cancer* and *cataracts* during the next ten to thirty years. Accurate predictions of an increase in skin cancer are hampered by lack of an animal model for UVB-induced basal cell carcinoma and melanoma. However, it is well known that short-wave UVB in the 295 to 300nm range is important in producing animal squamous cell carcinoma. In addition to the aging of the population and current trends towards excessive sun exposure, the depletion of the ozone layer is expected to result in an explosive rise in nonmelanoma skin cancer (NMSC) incidence.

The effects of global warming on skin infections and infestations

What is the greenhouse effect?^{46, 48}

Most of us know that the atmosphere of the earth is mainly composed of 78% nitrogen and 21% oxygen. If these were the only gases present, the average global surface temperatures would be around — 18°C; far too low to support life as we know it. Fortunately, our surface temperature has been remarkably constant for many thousands of years at around 15°C global average. This is due to the fact that the atmosphere also contains water vapour (0.2%) and carbon dioxide (0.03%). Together, these two naturally occurring gases form a warming protective blanket, which allows shorter wavelengths from the sun, including the invisible spectrum, to reach the surface of the earth, but blocks much of the longer wave infra-red energy from escaping into space.

Not all thermal energy from the earth is blocked (absorbed) by water vapour. It has a 'window' which is transparent to infra-red wavelengths between 8 and 18 μm. Carbon dioxide and other trace gases, some of which are man-made, exhibit strong absorption bands in this range, thus preventing escape of infra-red radiation. In effect, they dirty the window, trapping more infra-red radiation, throwing the natural flux off balance, and causing a warming of the lower atmosphere and surface of the earth. This is known as the 'greenhouse effect.'

In addition to water vapour and carbon dioxide, other gases have the capability of trapping longer wavelengths. These include methane (CH₄), nitrous oxide (N₂O), and chlorofluorocarbons (CFCs).

CFCs are not the only link between ozone depletion and global warming. Tropospheric, i.e. ground-level ozone, is a powerful greenhouse gas and contributes up to 10% of the global warming effect of carbon dioxide alone. Ozone production at ground level is driven photochemically, so as stratospheric ozone declines more ultraviolet radiation (UVB) penetrates the

lower atmosphere, thus enhancing production of tropospheric ozone. Ozone is also a powerful respiratory irritant.

Skin conditions which are likely to increase in severity and incidence in warmer climates

The skin conditions that are likely to increase in severity and incidence with global warming are dermatophytosis, streptococcal pyoderma, scabies, candidiasis, pitted keratolysis and tinea versicolor.

Reports of skin conditions derived from clinic visits, hospital records, or chart reviews are a poor, and frequently erroneous method of determining community prevalence and incidence of infections. Hence, there is no substitute for appropriately conducted surveys of the populations at risk. The populations most at risk are those exposed to the environment; the millions without air-conditioning, or other means of escape from the heat and insects, large families in substandard housing with inadequate plumbing or lack of water, refugees from areas of drought, flood, and war and similar disadvantaged communities. Particularly vulnerable will be the thousands of homeless who live on the streets of our cities. Exposed constantly to the elements, with little opportunity for personal hygiene, they suffer high attack rates of skin infections and infestations. Even in more affluent societies, we expect a warming climate to affect adversely those with outdoor occupations. Examples include construction personnel, farm workers, road crews and aircraft mechanics.

Photosensitizers and their place in the environment⁴⁹

Drugs, plant materials, perfume and cosmetic constituents, dyestuffs, polycyclic hydrocarbons in wood preservatives, coal tars, pitch and pollutants, sunscreen and printing ink materials and even metal salts are exogenous photosensitizers, agents which enter the skin from the surface or through parenteral administration in a domestic (Table 2), recreational (Table 3), industrial/working place (Table 4), or therapeutic setting (Table 5).

Table 2 Photosensitizers in the domestic environment

Bacteriostats in soaps	Halogenated salicylanilides; bithional; hexachlorophene
Wood preservative	
Vegetables	Psoralens in celery and parsnips

Table 3 Photosensitizers in the recreational environment

<i>Garden and countryside</i>	
Plant:	Umbelliferae: giant hogweed (<i>Heracleum mantegazzianum</i>) cow parsnip (<i>Heracleum sphondylium</i>) wild parsnip (<i>Pastinaca sativa</i>) tromso palm (<i>Heracleum lacinatedum</i>)
	Rutaceae: common rue (<i>Ruta graveolens</i>) gas plant (<i>Dictamnus alba</i>) Bergamot orange (<i>Citrus bergamia</i>) fig (<i>Ficus carica</i>)
	Moraceae:
	Furocoumarins: psoralen, 8-methoxypsoralen, 5-methoxypsoralen, pimpinellin, sphondin, angelicin.
<i>General</i>	
Perfumes and cosmetics:	5-methoxypsoralen (Bergapten) in oil of Bergamot, musk ambrette, 6-methylcoumarin.
Sunscreens:	<i>p</i> -animobenzoic acid (PABA), ethoxyethyl- <i>p</i> -methoxycinnamate, isopropylidibenzoylmethane, butylmethoxydibenzoylmethane
Tattoos:	cadmium sulphide

Table 4 Photosensitizers in the industrial/working environment

Anthraquinone based dyestuffs:	benzanthrone; Disperse Blue 35.
Polycyclic hydrocarbons:	pitch, coal tar, wood preservatives, anthracene, fluoranthrene. (roofers, pitch workers)
Drugs:	chlorpromazine
Plants:	giant hogweed, psoralens
Printing ink:	amyl-o-dimethylaminobenzoic acid
Animal feed supplement:	quinoxaline-n-dioxide.

Table 5 Major photosensitizers in the therapeutic environment

<i>Drugs</i>	
Antibacterial:	tetracyclines, sulphonamides, nalidixic henothiazines (chlorpromazine)
Antidepressant:	protryptiline
Diuretic:	chlorthiazides, frusemide
Antiarrhythmic/ antihypertensive:	amiodarone, methyl dopa, quinidine, propranolol
Anti-inflammatory:	benoxaprofen, ibuprofen, azapropazone, naproxen, piroxicam, tiaprofenic acid
Antifungal:	grizeofulvin
Bacteriostat:	halogenated salicylanilides, bithionol, buclosamide
Topical antifungal:	fentichlor, hexachlorophene
Anticramp:	quinine
<i>Therapies</i>	
Photochemotherapy:	8-methoxypsoralen, 5-methoxypsoralen, trimethylpsoralen, khellin
Photodynamic therapy:	photofrin II

Abnormal metabolites such as uro- and co-protoporphyrin, and normal metabolites in excess, such as protoporphyrin, bilirubin, kynurenic acid and riboflavin, are classified as endogenous photosensitizers.

The major reaction patterns of cutaneous phototoxicity are given in Table 6.

Table 6 The major reaction patterns of cutaneous phototoxicity

Types of skin reaction		Photosensitizers or diseases
1.	Pricking or burning during exposure, immediate erythema, oedema/urticaria with higher doses, sometimes delayed erythema/hyperpigmentation (Fig. 22)	Coal tar, pitch, anthraquinone based dyestuffs, benoxaprofen, amiodarone, chlorpromazine, erythropoietic protoporphyria
2.	Exaggerated sunburn	Drugs such as chlorpromazine, chlorthiazides, quinine, demethylchlortetracycline
3.	Late onset erythema, blisters with slightly higher doses, hyperpigmentation only with low exposures	Psoralens, phytophotodermatitis Berloque dermatitis
4.	Increased skin fragility giving blisters with trauma	Nalidixic acid, frusemide, tetracycline, naproxen, amiodarone, porphyria cutanea tarda

Photo-allergic reactions are based on immunological mechanisms, and can be provoked by UV radiation only in a small number of individuals who have been sensitized by previous exposure to the photosensitizer.

The common sources of photocontact dermatitis in Nigeria^{50, 51} are herbal concoctions and medicaments e.g. topical antihistamines and the antifungal agent buclosamide (Jadit). Herbal concoctions invariably contain psoralen type photosensitizers. The *Fagara* species and the genus *Citrus* (C) belong to the Rutaceae family which contains photosensitizing furocoumarins. The *Fagara* wood and *C. aurantiifolia* (lime) are fairly constant ingredients of herbal concoctions in Nigeria. Figs. 23-25 show the characteristic distribution of photodermatitis on the parts of the body maximally exposed to sunlight. Photodermatitis could be due to photo-allergic reactions, phototoxic reactions or aggravation of existing dermatoses by light.

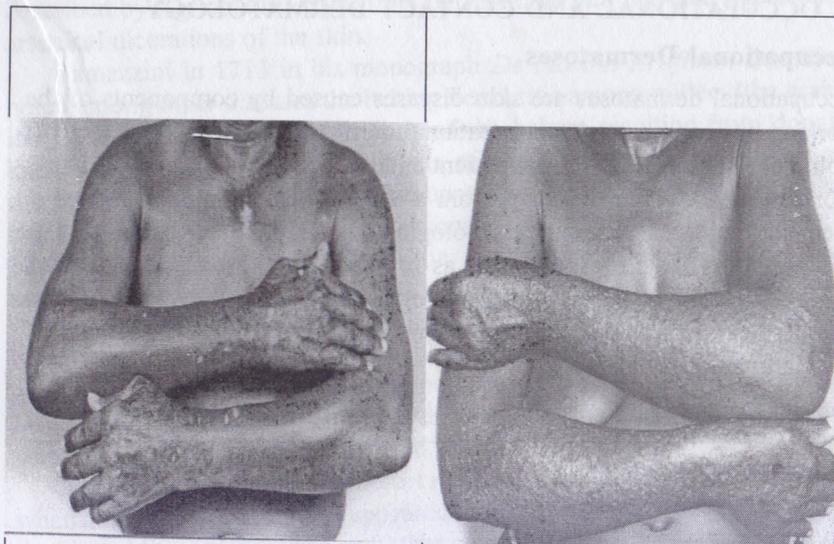


Fig. 22 Photosensitive hyperpigmentation from fragrance

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Fig. 24 Photodermatitis from buclosamide

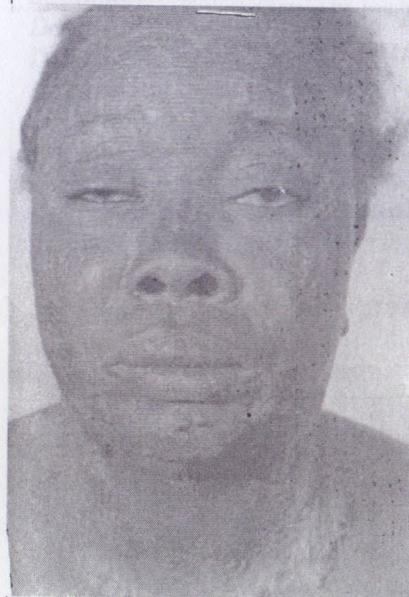


Fig. 23 Photodermatitis from herbal concoction



Fig. 25 Photodermatitis from a toiletry

◆ OCCUPATIONAL AND CONTACT DERMATOLOGY

Occupational Dermatoses

Occupational dermatoses are skin diseases caused by components of the working environment. An occupational dermatosis is a skin disease that would not have occurred if the patient had not been doing his or her work. Workers develop skin diseases from a variety of aetiological agents — chemical, physical, mechanical, biologic and miscellaneous causes. The skin reactions are correspondingly as protean as the aetiological factors, hence — “dermatoses”. Contact dermatitis is therefore one of the occupational dermatoses. Table 7 shows some of the causes and types of occupational dermatoses.

Table 7 Causal factors in occupational skin disease⁵²

Contact eczematous dermatitis
Irritant }
Allergic }
} acute and chronic
Physical and mechanical
Heat (burns, hyperhidrosis, erythema abigne)
Cold (frostbite, immersion foot, pernio)
Vibration (Raynaud's phenomenon)
Ionizing radiation (acute and chronic radiodermatitis, squamous cell carcinoma)
Nonionizing radiation (sunburn, microwave, infrared, laser)
Friction (calluses, blisters, abrasions, occupational stigmata)
Pressure (atrophy, bullae, necrosis)
Biologic causes
Bacterial (staphylococci, erysipeloid and tularemia)
Viral (herpes, orf, and warts)
Rickettsial (typhus, Rocky Mountain spotted fever, psittacosis)
Spirochetal (non-venereal syphilis)
Fungus (dermatophytes, yeast, deep fungi)
Arthropods (ticks, mites, fleas, mosquitoes, larvae)
Miscellaneous
Pigmentary alteration
Follicular and acneform eruption
Neoplasms (benign and malignant)
Granulomas
Ulceration (intentional and accidental)

Historical Aspects and Resources⁵³

Ulcers of the skin from contact with irritant substances were referred to by Celsus in the sixth book of his *De Re Medicina* as early as the first century AD. In 1498 Paracelsus documented the skin changes caused by metals in his monograph *Morbis Metallicus*. Ulceration of the skin in miners vividly called “black pompholyx” from contact with corrosive substances was

described by Agricola in 1556 in his *De Re Medicina*. He also referred to arsenical ulcerations of the skin.

Ramazzini in 1713 in his monograph *De Morbus Artificum Diatriba* noted among other diseases the itching dermatitis among millers (the grain itch), the hypertrophic hand lesions of the bakers resulting from dough kneading and other cutaneous stigmata of a man's trade, varicose veins of the legs among workers whose occupation necessitated long-continued standing and the primary syphilitic lesions of the hands of midwives, though he did not recognize them as syphilitic. Ramazzini advocated cleanliness and protective clothing.

In 1755, Percival Pott was the first to describe chimney sweep's cancer of the scrotum. In 1862, Bazinin published a classification of the causes of occupational dermatoses. The hypersensitivity, manifesting as a skin inflammation that occurs on repeated exposures to the same substances, was described by Jadassohn in 1896.

The modern work on the subject really began after the first World War, when numerous contributions appeared in the literature of France, Germany, the United State of America and other countries. Earlier twentieth century texts include Prosser White's *The Dermatogoses or Occupational Afflictions of the Skin*, in 1915, and Schwartz, Tulipan, and Birmingham's *Occupational Diseases of the Skin* in 1957. Selected current resources for more in-depth information include Cronin *Contact dermatitis* (1980); Taylor JS (ed), *Dermatologic Clinics* (6:1-129, 1988 and 12:461-600, 1994); Marks and DeLeo's *Contact and Occupational Dermatology* (1997); Adams' *Occupational Skin Disease* (1999); Kanerva et al.'s *Handbook of Occupational Dermatology* (2001); Fisher's *Contact Dermatitis* (2000); and Rycroft et al.'s *Textbook of Contact Dermatitis* (2001).

Occupational dermatology is as much a branch of preventive medicine as of dermatology. Its primary thrust should be to prevent both skin diseases and toxicity from environmental agents rather than just to provide therapy. All occupational skin diseases are preventable by decreasing or eliminating exposure to the causal agents in a variety of ways. Hence, a precise etiologic diagnosis, which in many cases means the identification of single or multiple causal agents leading to a dermatosis, is critical to effective management of such problems.

Available statistics show that worldwide skin diseases constitute the commonest manifestation of occupational diseases, and the commonest cause of loss of working hours. Both the incidence and types of occupational dermatoses vary from industry to industry and from location to location as patterns of employment vary. Among major industrial categories, the highest risks are seen in agriculture, forestry, fishing, and manufacturing. Industries with a very high incidence of dermatitis are (a) leather tanning and finishing,

(b) poultry dressing, (c) adhesives and sealants, (d) boat building and repairing (e) fresh or frozen fish packaging, (f) poultry and egg processing, (g) abrasive products, and (h) landscape and horticultural services.

Occupational dermatoses should never be regarded as an invariable accompaniment of work and there is no "acceptable" incidence of occupational disease.

Furthermore, occupational skin diseases are often not just 'skin deep.' For example, certain halogenated aromatic chemicals e.g. polychlorobiphenyls (PCBs) are the most potent acnegens as well as the most toxic environmental compounds known to man. These chemicals may produce chloracne, (Fig. 26) an extremely refractory type of acne, that may also be accompanied by systemic toxicity. The PCBs are acnegenic, hepatotoxic, and porphyrinogenic compounds hence the presence of occupational acne is often an indication of exposure to deadly hepatotoxins in the work environment. Also some workers e.g. oil field workers, foresters, construction workers, agriculturists, and surveyors who are exposed to arthropod bites are victims of several arthropod borne diseases (Table 8)⁵⁴

Table 8 Arthropods and associated illnesses⁵⁴

Arthropod	Examples of associated illnesses
<i>Insecta</i>	
Lice	Typhus, trench fever, relapsing fever
Fleas*	Bubonic plague, typhus, tungiasis
Bedbugs*	Pruritic papules, possibility of HBV transmission
Flies, mosquitoes*	Cutaneous myiasis, malaria, yellow fever, dengue fever, viral encephalitis, onchocerciasis, leishmaniasis, sleeping sickness, West Nile fever
Bees, wasps, ants	Local reactions, anaphylaxis
Reduviid bugs	Chagas disease, papulobullous reactions, anaphylaxis
<i>Arachnida</i>	
Spiders	"Necrotic arachnidism," paralysis
Scorpions	Local tissue damage, neurotoxicity, cardiorespiratory collapse
Ticks	Granuloma formation, Lyme borreliosis, Rocky Mountain spotted fever, tick paralysis, Colorado tick fever, babesiosis, ehrlichiosis, Q fever, tularemia
Mites*	Hypersensitivity dermatitis, scrub typhus, scabies, possibility of role in rosacea
Others	
Centipedes, millipedes	Local tissue damage, "mahogany" stain

*Commonly cause papular urticaria.

which may atimes be fatal if not diagnosed and managed promptly. Hence, seemingly innocent papular urticaria (Fig. 27) is not often a benign sign and may actually foretell more serious bacterial, rickettsial, viral, or parasitic disease. A simple hand eczema (Fig. 28) may set in motion severe debilitating psychosocial turmoil as already discussed under Psychocutaneous disorders.

In the management of occupational skin diseases, the diagnostic assessment is of critical importance. The objectives are:

1. To determine the nature and character of the eruption.
2. To determine the etiologic agent(s) as well as accessory factors which influence the pathogenesis and severity of the reaction.
3. To determine whether the eruption is occupational.
4. To control or eliminate the hazardous agent(s) in the workplace and other environments.

Hazard detection and prevention strategy involves plant visit and survey, and epidemiologic studies. Preventive measures involve pre-use testing and evaluation, substitution of materials of lesser hazard, education, engineering and industrial hygiene controls, personal protective clothing, detection of susceptible individuals and personal hygiene.

There are legal, legislative, and regulatory aspects of occupational dermatology. The fundamental principle behind workmen's compensation

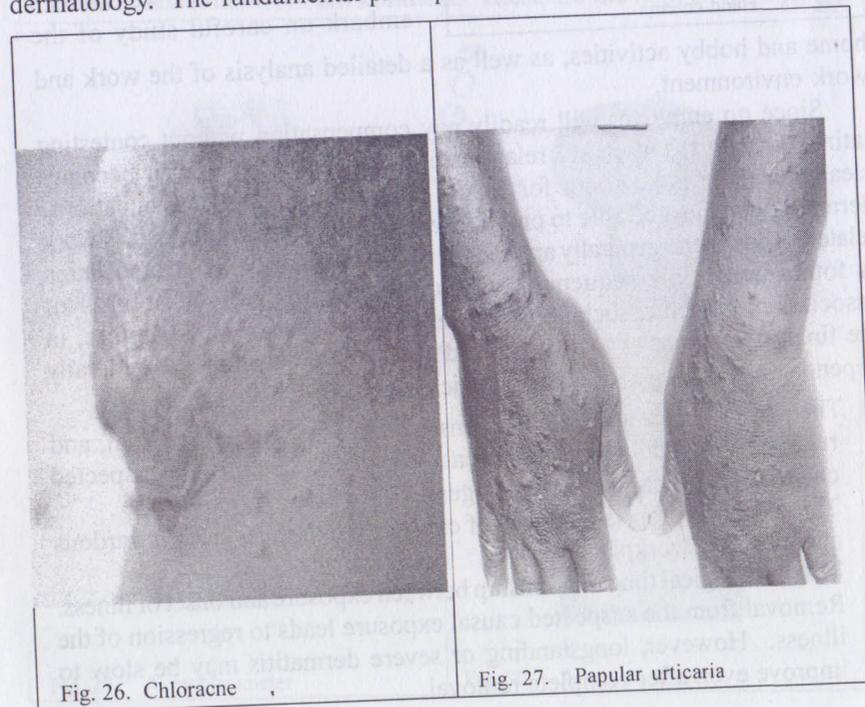


Fig. 26. Chloracne

Fig. 27. Papular urticaria



Fig. 28 Hand eczema

is that there is liability without fault. Workers that develop a new skin disease often believe it is caused by their work solely because the condition did not exist prior to employment, especially if it is a new job. It is tempting for physicians to accept this explanation, particularly if the worker is known to be exposed to one or more hazardous chemicals. However, of 168 hours in a week, the average person works only 35 to 40 hours. Assuming that 7 to 8 hours of every 24 are spent in sleep, 75 to 80 hours a week are taken up with non-occupational pursuits, more than twice the time spent at work. Keeping this in mind, we can then embark on careful study of the

home and hobby activities, as well as a detailed analysis of the work and work environment.

Since no employer will readily pay compensation without contesting (atimes in court) the causal relationship with the dermatosis, it becomes clear that there is no room for casual diagnosis, hence the occupational dermatologist must be able to prove *forensically* that the dermatosis is work related. The criteria generally applied for causal inference when an association is found are: time sequence, consistency on replication, strength of association, graded association, coherence and experiment. Therefore, in the final assessment as to whether a dermatosis is occupational generally depends on six categories of diagnostic criteria.

1. The physical appearance of lesions, patterns of clinical reaction, and regional distribution are consistent with disease due to the suspected chemical, physical, or biologic agents.
2. There is an appropriate history of exposure to the suspected hazardous agents at the workplace.
3. There is a logical time relationship between exposure and onset of illness.
4. Removal from the suspected causal exposure leads to regression of the illness. However, longstanding or severe dermatitis may be slow to improve even after complete removal.

5. Possible non-occupational provoking agents appear ruled out as likely causes.
6. Investigations show a specific possible causal relationship (e.g., patch testing in allergic contact dermatitis)

The possibility that multiple causative agents may be involved in any occupational dermatosis should not be overlooked.

Some observations in Nigeria⁵⁵⁻⁶⁵

In a tropical country like Nigeria certain dermatoses are directly or indirectly related to hot humid environments. In order to assess the amount of heat stress to which workers in a particular environment are exposed, it is necessary to carry out the following measurements. These are air temperature measured with an ordinary mercury dry bulb thermometer; wet bulb temperature; black globe thermometer to measure radiant heat; and air velocity using an anemometer (Figs. 29, 30). With the aid of a special (psychrometric) chart, the humidity can be calculated using the dry and wet bulb thermometer reading. Patch Testing is also mandatory in the evaluation of patients with allergic contact dermatitis (Fig. 31-33).

The worker in tropical industries could be exposed to two sources of heat which affect his work environment. These are the high environmental

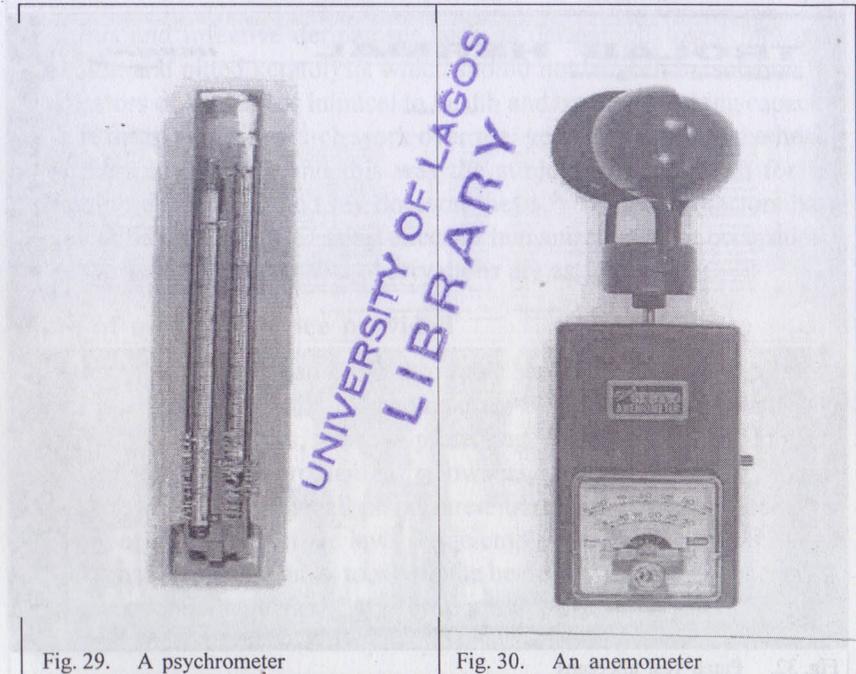


Fig. 29. A psychrometer

Fig. 30. An anemometer



Fig. 31. Patch Test tapes

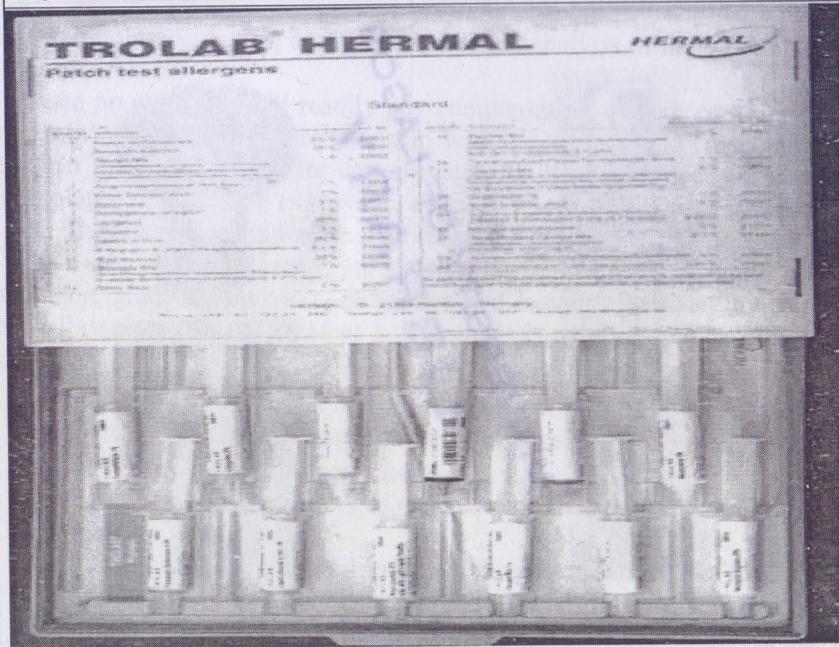


Fig. 32. Patch Test allergens

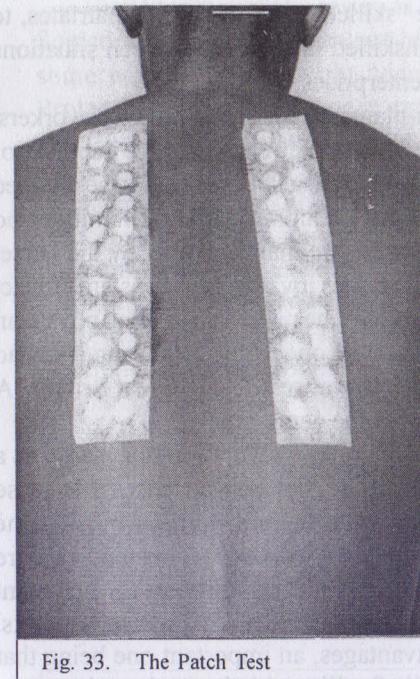


Fig. 33. The Patch Test

temperature of the tropics and the heat generated by the plant, associated with high humidity.

Such is the degree of ventilation needed in factories in this environment, that air movement could be greatly enhanced by improved building design and technology rather than the installation of ceiling fans in tall buildings. The ceiling fans prevent the hot air from rising, and at best only help to circulate the hot air in the absence of effective ventilation. In some cases residential buildings were simply converted to factories. Excessive environmental heat exposes the worker to the development of not only pruritic miliaria rubra but also contact

dermatitis and infective dermatoses such as dermatophytoses, pityriasis versicolor, and pitted keratolysis which should not be seen in isolation but as indicators of heat stress inimical to health and optimal working capacity.

The thrust of my research work over the years has been on the health of workers in industry and this was the subject of study both for my Fellowship dissertation and my doctoral thesis.^{64, 65} Several factors have been identified, that militate against effective humanization of the occupational life of workers. Some notable observations are as follows:

Types of medical service provided

Occupational medicine can be said to have secured universal acceptance even if its essence may still in some quarters be imperfectly understood.

Industrial legislations, aimed at protecting workers, is embodied in the statutes of Nigeria. The problem is that owners of industrial establishments, particularly managers of small plants, are either ignorant or pretend not to be aware of this aspect of the law. Some employers are avaricious. Some are foreign owned companies to whom the health of workers is a secondary or inconsequential requisite. Some have provided health services as part of a general paternalistic welfare policy for workers. Quite often there are

separate health arrangements for the "skilled" staff, usually expatriates, to the utter neglect of the indigenous unskilled labour force. Such situations are not restricted to foreign-owned enterprises.

Some large enterprises provide in-plant health services for their workers. Where general medical services are beyond the reach of large sections of the population, occupational health services will justifiably tend to be diverted to the provision of treatment, sometimes including workers' families and dependants. Some of these establishments are managed only by the nurse, at least for the junior workers who are the ones invariably in constant contact with the noxious agents at work. Sometimes the name of a visiting physician is on paper, just for the records; for example one of the establishments had on its records the name of a physician who was residing in Great Britain. A different health arrangement is made for the senior staff.

Sometimes these in-plant clinics are set up by employers primarily as a self protective mechanism to avert spells of sickness absences and these workers are refused the right to ask for a second opinion outside the company's health establishment. More often a worker needing medical care for occupational and non-occupational diseases has to report for treatment to a physician or a medical service outside the undertaking where he works. This state of affairs has certain disadvantages, an important one being that the attending physician may not be fully familiar with the work environment and work-related requirements of his patients.

Some industrial concerns import machines and all available literature in foreign language. Sometimes foreign doctors are employed in the plant clinics primarily and solely for their nationals, while the nurse is left alone to manage the Nigerian workers. All the drugs used by these foreign in-plant doctors are brought from their country and the labelling and literature on these drugs are in foreign language so that the factory nurse who invariably is a Nigerian has no access whatsoever to these drugs. She is simply left alone to prescribe and dispense antimalarials, analgesics, corticosteroid and antifungal creams for whatever the workers complain of. Invariably these workers are pacified by two to three days sick leave, and in a number of cases when the symptoms are beyond comprehension the patient is dismissed as a malingerer.

Frequently, the lack of provision of safety and other health measures does not stem from ignorance on the part of management but in the belief that unskilled labour is surplus in the country. With prevailing high unemployment and poverty, the threat of dismissal is a very powerful disciplinary weapon. A largely illiterate labour force has only limited job alternative.

Human materialistic instincts are also powerful forces to reckon with. Sometimes the conflict has not been the sole preserve of management as some workers have sought "danger money" rather than safe working. Protective clothing e.g. nose masks, boots, gloves, aprons, and other garments (when available) are sometimes not personalized (but are free for all) and this practice promotes spread of infective dermatoses. The 'protective' clothing are hardly changed nor laundered and are often coated with contactants and chemical splashes which cause dermatitis; pores of nose masks are clogged with chemicals which are often inhaled under hot humid environments. Indeed these protective clothing, paradoxically, served as further micro climate conducive to the development of dermatoses.

Some work environment could be very hot and humid and this may discourage the worker from wearing protective clothing. Furthermore, a hot, humid environment promotes hyperhydrosis and the acidic sweat bleeds out chemicals from protective clothing which cause dermatitis (Fig. 34, 35). A hot humid environment also promotes fungal and bacterial infections of the skin.

Some employers still continue to use old generation antiquated machinery which lack automation, hence exposing the workers to chemical splashes



Fig. 34. Clothing dermatitis



Fig. 35 Dermatitis from *p*-phenylenediamine in rubber gloves & boots

and inhalation of toxic fumes. Furthermore, the old machines generated unacceptable noise levels which promote progressive hearing loss.

Majority of the occupational diseases currently occur in small manufacturing establishments. These facilities generally have poorly developed preventive medical and hygiene services and are usually supervised by management personnel who have to carry out an assortment of functions within the organisation and are in dire need of education about preventive programs.

Enlightenment of workers and employers

The provision of information to the various bodies concerned with the health of the working population is an essential pre-requisite for the establishment of occupational health services. The provision of carefully presented information is no substitute for positive action but is a powerful stimulus to its effectiveness. The information should be directed towards the general public, the workers and the employers, as well as towards the governmental administration.

Occupational health service cannot develop extensively, receive adequate recognition or be an effective influence without the active participation of workers. Question of health and safety in industry tends to be more often considered in terms of extra pay and benefits. It is essential to stimulate understanding on the part of workers, either as the opportunity arises or by organizing meetings and courses. This information must be presented at the level of the workers, especially those involved in negotiations.

The body legally vested with the authority to monitor health problems in the Nigerian industry is the inspectorate division of the Ministry of Labour. The factory inspectors could be administrative officers or industrial hygienists who perform periodic inspection of factories to find out among other things, the number of toilets, cloak rooms, catering facilities and waste disposal systems of the factories.

Factory Inspectorate in industrialized countries has moved away from the concept of cyclical inspection, as still exists in Nigeria today, towards the era of specialist inspection. The intricacies and sophistication of modern industry necessitated this development. The factory inspectorate in Nigeria has only a handful of officers and could not possibly be expected to inspect or enforce any factory act in the thousands of factories, minor or major, registered and unregistered which now flood the country.

Talks to working groups about particular occupational hazards may, from time to time be undertaken. These are preferably short and informal. These talks should be conducted within the working premises. A frequent

mistake is holding formal seminars in prestigious buildings like universities, the arts theatre, hotel conference rooms, etc. Some companies send no delegates, sometimes genuinely due to financial constraints. Quite often efforts at organizing workmen are rendered very difficult by the severe class stratification of the society and the fear by some employers that should the workers get above their station, there would be terrible excesses.

Formal workshops and seminars end up merely as academic exercise. When the talks are held within the working premises, the group is more likely to discuss health problems in a Nigerian industry employing a largely illiterate labour force, manufacturing textiles in a building originally meant to be residential; or a factory inspected and registered as a biscuit factory but which in addition has taken on the manufacturing of detergents without the licensing authorities knowing. Sometimes only the middle or senior management cadre is sponsored to these formal workshops and seminars. They return to their workplace and the workers who are the ones exposed have no clue as to what was discussed.

Familiarity with the working environment is essential for the effective practice of occupational medicine. The bodies or persons to give out the instruction also have to be properly scrutinized and preferably chosen by the occupational health units in the Ministries of Health and Labour which could jointly build up an effective and functional National Institute for Occupational Safety and Health. To have a single authority responsible for health is most desirable as it is cheaper and more effective than fragmenting it in various ministries.

Feeding the workers with wrong information is even more dangerous than no information at all. For example a certain company made its workers believe that a can of milk which the factory dispensed at the end of a work day could "flush out" all the poisonous substances inhaled in a factory where solvents which are hepatotoxins and chemicals which are haemolysins were being inhaled. Unfortunately it was found that when these workers branched out to form their own companies, the above misleading information was handed down to subsequent apprentices and this gave the workers a false sense of security.

The Factory Act states that the following are notifiable occupational diseases: lead poisoning, phosphorus poisoning, mercury poisoning, toxic anaemias, toxic jaundice etc. The only notifiable dermatoses are anthrax and chrome ulcers! It is not surprising that the Factory Inspectorate has no data on occupational diseases in Nigeria. Who is available to diagnose the above conditions? How many cases of toxic jaundice have been dismissed as "Yellow fever" by the workers who report in a hospital months or years

later with cirrhosis of the liver or liver cancer and whose death certificates simply read "cause of death.....liver cirrhosis"?

A group of road side mechanics who spray cars in non-ventilated booths made of corrugated iron sheets were found to possess bottles of haematinics which they took constantly because according to them "they suffered from excessive fatigability or dizzy spells because the paints dry up the blood." These workers obviously suffered from solvent poisoning or even lead poisoning. These road side mechanics patronize health centres where they are lost or treated as malaria by an exhausted medical officer who is expected to treat over 200 patients in one clinic day. Obviously a disease that is not diagnosed cannot be recorded.

On examination of factory records, one frequently finds weekly records like "respiratory problem 25; skin problems 30; eye problems 2 etc". To a physician such forms of recording convey no message. Some factory nurses merely served as welfare officers and kept no records at all on health problems. One cannot blame the factory nurse because she has been asked to perform the functions for which she has not been trained. The situation now in Nigeria is that the factory nurse is the life-wire of any health programme in industry. However the majority of the nurses in industry do not have any special training in industrial nursing but have abandoned the government hospital for the industry for various reasons. There is therefore a need for a reappraisal of the nursing curriculum.

Legislation and policy implications

This is mentioned because of its basic necessity and also because it can be enacted regardless of the state of economic and social development in any country, because if it is possible for employers to exploit the workers, occupational health can never be a reality. Suitable labour laws, adequately enforced, are therefore essential pre-requisites to any effective occupational health programme.

Sometimes the application of legislation will meet considerable difficulties. Experience in developed countries has shown that the protection of occupationally injured workers and those who contract occupational diseases is a secondary important requisite. The employers often tend to resist or delay workmen's compensation payment by denying responsibilities. The victim of such uncertainty is the injured worker. The major beneficiaries may be only the lawyers hired by both sides to press or resist the claim.

As have been noted earlier most of the existing factories in Nigeria are small units. It has been my observation that morale in some of these small units is often very high and workers often belong to a family unit or behave

as one so that cash penalties may not be welcome by both the employer and the employed.

Employer's liability insurance schemes

This has been another topical issue which requires employers to take out and maintain approved insurance policies sustained by employees in course of employment. One of the major difficulties observed in establishing these schemes in a developing country like Nigeria is the lack of statistics upon which to calculate the necessary actuarial data. A country where receipts for drugs not purchased can easily be got and where a janitor in an health institution can get hold of hospital documents and sign sick leave papers on a commercial basis, cannot be regarded as ripe for such schemes. There is no doubt that the objectives are laudable. However there are bound to be serious problems in the implementation of this scheme in Nigeria.

Women in employment

There has been a tremendous increase in the number of women at work in Nigeria. However there is an unhealthy trend in Nigeria for mothers to take their babies to work (as long as their employers raise no objection). A few examples are as follows:

- (a) A young lady (a laboratory assistant) carried her child on her back while she cultured sputum from tuberculous patients.
- (b) Women are now increasingly being recruited at building sites to carry pails of concrete or cement. At one building site, I have personally witnessed mothers laying their babies on the nearby open field while they carry on their jobs. These babies were completely covered by mosquitoes and there have been instances of snake bites!

The above are examples of situations where there is need to have sanctions necessary to protect the child even if they may appear on the surface to adversely affect the mother.

Health risks for women workers are intimately related to the problem of fatigue. Most women workers have in addition to their work, a multiplicity of other family and social reasons for becoming and staying over-tired. The answer to women's overload in a developing country is, of course, not to restrict their employment but to develop the social and other measures which reduce the grounds for fatigue. These include, in particular, improved and affordable household technology and services e.g. regular water supply and electricity supply, which are necessities and not luxuries. The control of occupational diseases and work accidents must depend not only on improvement in the working conditions but also on the humanization of occupational life.

Some people have the mistaken idea that the ideal woman is retiring, servile, and entirely domestic. Not so! Read **Proverbs 31:10-31**. An ideal woman, according to God's standards, is an excellent wife and mother, a multi-talented, resourceful, hardworking woman with great skills, strong character, great wisdom, and great compassion. Her strength and dignity do not come from her amazing achievements, however. They are a result of her reverence for God. Women must work and contribute to the well-being of the family. Hence, every effort should be made both at home and at work to humanize the occupational life of women.

◆ **THE HAIR AND NAIL IN FORENSIC, SPORTS, ENVIRONMENTAL AND GENERAL MEDICINE**

The hair and nails are not just inert structures. Drugs, chemicals, and biological substances accumulate and are stored in hair and nails where they can be detected and measured. The hair and nails may also give a history of drug intake and abuse, as well as toxin exposure, and therefore, represent a unique substrate for forensic purposes. Table 9 shows the drug and substances that can be measured in hair and nails.⁶⁶

Table 9 Drugs and substances that can be measured in hair and nails⁶⁶

-
- Amphetamine/metamphetamine
 - Anticonvulsants
 - Benzodiazepines
 - Cannabinoids
 - Chloroquine
 - Cocaine/benzoylecgonine
 - Doping substances
 - Fluconazole
 - Indinavir
 - Itraconazole
 - Ketoconazole
 - Morphine/dextromoramide
 - Neuroleptics
 - Nickel
 - Nicotine/Cotinine
 - Polyamines (putrescine, spermidine, spermine)
 - Sexual hormones (estrone, 17 β -estradiol, DHT, epitestosterone, testosterone, pregnenolone)
 - Terbinafine
 - Trace elements (aluminium, arsenic, cadmium, chromium, copper, gold, iron, lead, manganese, mercury, selenium, silver, thallium, zinc)
-

Techniques utilized for dosing substances in hair and nails include gas chromatography, mass spectrometry, nuclear activation, x-ray fluorescence and emission, and atomic absorption and emission.

The basic chemical composition of the hair shaft and nail plate is not influenced by changes in the blood chemistry or by exposure to chemicals which occurred after hair and nail formation. The nails are an interesting substrate due to their slow growth rate making them useful for retrospective analysis. The great toenail, which reflects body exposure in the previous twelve months, is best utilized for these purposes also because it is less exposed to external contamination. Long scalp hair may provide retrospective information of the previous five to seven years. Axillary and pubic hair can be utilized when the scalp hair is cut short.

Advantages of analyzing hair and nail samples also include their easy and non-invasive collection, the small sample size required for analysis, and their easy storage at room temperature. However, hair analysis can be altered by cosmetic procedures such as dyeing, bleaching, and permanent waving which decrease drug or toxic content in hair.

Hair and Nail in Forensic Medicine

Fingernail clippings of victims have been utilized in looking for the DNA of aggressors in cases where the victims struggled to defend themselves.⁶⁷ DNA typing can be performed easily on plucked hair and dandruff scales.⁶⁸

Hair and Nail in Sports Medicine

Some cases of drug abuse and poisoning can be suggested by examination of nail and/or hair, and can be confirmed by analysis of nail or hair clippings. Hair analysis is also very useful in identifying doping practice in professional athletes. Doping substances that can be detected in hair include clenbutenol, corticosteroids, ephedrine, methenolone, nandrolone metabolites, salbutamol, stanozolol, and testosterone. The storage of both nandrolone and its metabolites (norandrosterone and noretiocholanolone) in hair samples permits a discrimination between intake of doping agents and intake of other 19-norsteroids such as norandrostenedione and norandrostenediol which are available in over the counter vitamin supplements.⁶⁹

Hair and Nail in Environmental Medicine

Some toxins, such as arsenic and thallium, are stored in the hair and nails and can be utilized for diagnosing their ingestion.^{70,71} They also cause nail abnormalities that can be recognized by the physician, such as transverse leukonychia (Mee's lines), due to arsenic poisoning. Cryptic sources of

arsenic exposure are listed in Table 10. The largest risk from wood products occur when pretreated wood is burned and the arsenic fumes are inhaled. Hair exposure to chemicals may produce hair discoloration as in the case of green hair (copper from water or cosmetics) or blue hair (cobalt workers). Hair loss is an evident symptom of some poisoning e.g. thallium often used in rat poisoning. Burning plywood treated with chromium-copper arsenate in a home stove is another subtle way to produce arsenicism. Hair loss may lead to the diagnosis in accidental ingestion or deliberate suicidal ingestion of rat poison.

Several trace elements can be detected in hair and nail samples, but the vast majority comes from the environment, e.g. from pollution and cosmetics. Hence, hair and nail samples can be utilized to evaluate environmental exposure to pollutants (lead, nicotine) or metals (nickel, chromium) in occupational exposure to the metal with concentration in the nails that parallel the degree of exposure in the workplace.

Table 10 Cryptic arsenic exposure⁸⁰

Medicinal	
	Chinese herbal balls
	Fowler's solution
	Asiatic pills
	Aphrodisiacs
	Poison (homicide, suicide)
Occupational	
	Mining and smelting
	Wine-making
	Carpentry
	Agriculture and gardening
	Computer chip production
	Electroplating
	Fishermen (marine plywood, eating contaminated seafood)
	Dyeing fabrics & domestic articles
	Preservation of animal skins & hides
Environmental	
	Contaminated well water, soil, vegetation
	Pesticides, rodenticides, herbicides, insecticides
	Burning plywood
	Contaminated shell fish
	Desiccants, feed additives (wood presentatives)
	"Moonshine" alcohol (illegally produced alcoholic beverages)

Hair and Nail in General Medicine

Hepatitis B virus DNA can be detected from nail clippings of hepatitis B surface antigen-positive patients.⁷⁴ At times doctors have no information about a patient's previous renal function. Measurement of creatinine from the nail plate can be utilized for differentiating acute from chronic renal failure where the distal nail clippings contain elevated levels of creatinine.⁷⁵ Increased levels of porphyrins in hair and fingernails have been detected in patients with porphyria cutanea tarda. Monitoring treatment compliance in psychiatric, epileptic, and HIV patients can be done through hair analysis.⁷⁶ Dosage of androgens in terminal scalp hair may provide a basis for predicting baldness: the ratio of testosterone-epitestosterone is significantly greater in the hair of balding fathers and their sons than in hair of non-balding control subjects.⁷⁷

Defective hepatic metabolism of alcohol and drugs can be predicted by genotyping alcohol dehydrogenase in nail clippings.⁷⁸ Nail clippings can be utilized for assessing long-term control of blood glucose levels in diabetic patients.⁷⁵ The presence of furosine and fructoselysine in the nails, indicates non-enzymatic glycosylation and, therefore, episodes of diabetic hypoglycemia in the previous three-five months. Measuring concentrations of polyamines (putrescine, spermidine, spermine) in the hair may be helpful in diagnosing and assessing disease activity in women with cervical or ovarian cancer. Dosing polyamines in the hair shaft is preferred to measuring them in plasma and urine due to the polyamine variations throughout the day in plasma and urine.^{77,79}

Arsenic contamination in groundwater^{81, 82}

The World Health Organisation (WHO) maximum recommendation or allowable level of arsenic in drinking water is 0.01 ppm (mg/L or µg/mL). Epidemiological studies have shown that those who live in villages located near old tin mines where workers dumped arsenic into the pond after extracting the tin and wolfram developed evidence of arsenic poisoning. It is postulated that, with the passage of time, there must have been seepage of arsenic under the ground which eventually contaminated the nearby places and drinking wells. Arsenic contamination in groundwater affected 35 million people in Bangladesh, and in a subsequent epidemiological study, more than 50% of the villagers showed some skin manifestations due to arsenicosis. Keratosis on the soles was the most sensitive marker for the detection of arsenicosis.⁸¹

The estimated dose of arsenic that can cause keratosis and skin cancer is about 0.5-1g, regardless of whether it is from arsenic medicine (acute poisoning) or has accumulated through the drinking of water containing small amount or arsenic of about 0.4-0.6 mg/L (400 µg daily over many months or years). The latent period for papules to become noticeable is as early as 6 months when drinking water highly contaminated with arsenic. A

similar observation was noted by mothers of babies afflicted by the same condition. Patients do not usually seek medical advice until after about ten years, as in some series.⁸¹ This delay was twenty-four years in another study, when extensive full-blown keratosis had occurred.⁸² This may be important because the estimated lifetime risk of dying from cancer of the liver, lung, kidney, or bladder as a result of drinking water with a level of arsenic of 0.05ppm could be as high as 13 per 1000 persons.

Those who do not develop cancer may be protected by anti-oxidants, e.g. selenium in the diet. Nutritional deficiency may be one of the risk factors for the development of malignancy. Arsenic can also induce gene amplification in mouse cell culture. This may cause a delayed effect. The latencies calculated from epidemiologic studies of arsenic carcinogenesis have varied over a wide range. The latency period for the development of Bowen's disease varied from ten to twenty-four years, invasive squamous cell carcinoma occurred twenty years after exposure, and internal malignancy (lung and bladder cancers) occurred after about ten years or after one to forty years. Smoking seems to be an aggravating factor for lung cancer. Therefore, one should investigate for internal malignancy, especially *bladder* or *lung* cancer, after ten years; however, the latency period varies according to the dose of arsenic exposure. The incidence and mortality ratios of internal cancers were found to be increased in direct proportion to the time period over which contaminated water had been consumed and to the level of arsenic in the drinking water. The cause of such an increase may be the ingestion of certain kinds of vegetables and fruits grown in the area, containing high levels of arsenic.

Cryptic sources of arsenic poisoning in Nigeria

Possible cryptic sources of toxic chemicals in Nigeria have been observed from the skin lesions of patients. These are from villages near "illegal" mining sites; from the burning of plywood (as "fire wood"); contaminated well water, and pesticides.

The clinical manifestations of chronic arsenic poisoning are listed in Table 11.

Sporadic cases suggestive of chronic arsenic poisoning have been seen in our skin clinic. Regrettably, most of them are lost to follow-up during the process of conducting toxicological studies. As shown in Table 11, patients with manifestations of chronic arsenic poisoning may present in a broad spectrum of specialists out-patient clinics. Since the extracutaneous diseases listed above have other possible aetiologies, it is possible for medical practitioners to miss the link with arsenic except there is a high index of

Table 11 Clinical manifestations of chronic arsenic poisoning

1. Skin and mucous membrane	2. Cardiovascular system
<i>Nonspecific lesions.</i> Eczematous contact dermatitis. Conjunctivitis, rhinitis, and nasal septum perforation (arsenic dust and fumes)	Digital cyanosis Raynaud's phenomenon (Fig. 39)
<i>Specific pigmentary changes.</i> "Rain drops on a dusty road" patterned lesions (Fig. 36)	Black foot disease (dry gangrene of the feet)
Lesions resembling idiopathic guttate hypomelanosis	3. Central and peripheral neuropathy
Dark pigmentation involving palmar and plantar surfaces	Low mental intelligence
Argyria-like pigmentation of the total skin surface with myriad of hypopigmented macules	Peripheral neuropathy
Transverse white streak on nail (Mee's line): not observed in the chronic type	Sensory neuropathy
<i>Specific and diagnostic lesions.</i> Hyperkeratotic papules on the palms and soles. No palmar pits at any stage. Four stages are classified	4. Hematologic abnormalities
<i>Stage 0.</i> No skin lesions but the arsenic level in hair and nails is high	Anemia, anisopoikilosis, large basophilic toxic granules
<i>Stage I.</i> A few small pin-head-sized flesh-coloured papules with tiny black-brown macules on the side of fingers and palms	5. Miscellaneous
<i>Stage II.</i> Numerous pin-head-sized to 0.5cm flesh-coloured keratotic papules	Gastrointestinal symptoms
<i>Stage III.</i> Larger keratotic papules up to 1-1.5cm covered with yellowish keratotic plaques on the center and slight delling	Encephalopathy
The histopathologic changes are Bowenoid-like (Fig. 37)	Hepatomegaly and cirrhosis
<i>Stage IV.</i> Tumor stage: typical lesions of Bowen's disease, basal cell epithelioma or squamous cell carcinoma. (Fig. 38)	6. Other cancers
	Hepatic angiosarcoma (Fowler's solution)
	Cancers of lung, large intestine, stomach, nervous system, kidney, bone, liver, bladder

suspicion. However, some of the skin manifestations are fairly specific to arsenic poisoning.

Chronic arsenic poisoning is a serious problem in developing countries due to the drinking of groundwater naturally contaminated with this element. In addition, carelessness in the dumping of pesticides, the leakage of waste products into the water supply, and the inhalation of arsenic fumes represent other routes of poisoning. The remote area of Ronpiboon District in the southern part of Thailand provides an example of such a catastrophe which took more than three decades before detection, diagnosis, and treatment were implemented. Many communities and individuals in Nigeria sink wells and boreholes to source water for domestic use. Some patients, whose domestic source of water is from borehole or well, are often quick to give the information that their water is "treated water"; but chlorination of water is for bacterial contamination; it will not reduce arsenic content.



Fig. 36. Arsenical hyperpigmentation

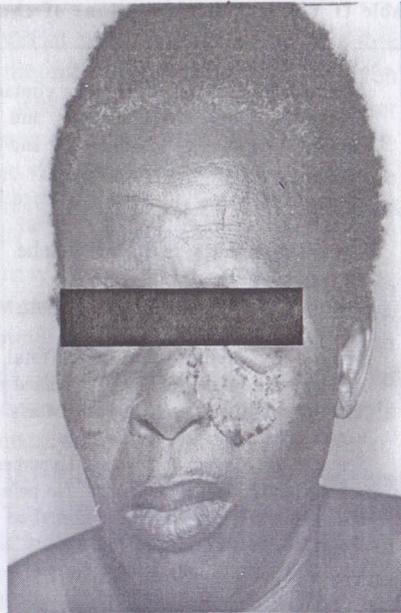


Fig. 38. Bowen's disease



Fig. 37. Arsenical keratosis



Fig. 39. Raynaud's phenomenon

Relevant specialists to diagnose the clinical manifestations of chronic arsenic exposure are not likely to be found in primary health facilities in the remote villages where the risk factors are high. Even if some affected patients filter into health facilities in urban areas and the diagnosis is made, the likelihood is that they will be managed as 'cancers of unknown aetiology.' Liver cancer is unequivocally one of the commonest cancers in Nigeria and is largely *assumed* to be triggered by infectious agents e.g. certain moulds and viruses; and bladder cancers are also largely *assumed* to be due to another species of infectious agents—bladder flukes. In developing countries, like Nigeria, where communicable diseases loom large, most diseases of unidentifiable aetiologies are readily linked to infectious agents; whereas if these same diseases were found in developed countries, a painstaking search for environmental/industrial toxins will be made. Furthermore, even in developed countries with well structured health facilities, causal relationship to environmental chemical toxins are usually made by eagle-eyed, persevering, clinical epidemiologists because of the long latency period between exposure and clinical manifestation.

Adverse effects of pesticides

Insect repellents are marketed in every practicable form—aerosols, creams, lotions, suntan oils, powders, grease sticks, and cloth-impregnating laundry emulsions. Regardless of the form, time of protecting varies with the chemical, the person, the environment, the insect species, and the zeal of the insect.

The association of pesticides with cancer is not novel. From animal studies, many sulfallate are carcinogenic, whereas others including organochlorines, dichlorodiphenyltrichloroethane, chlordane, and lindane are tumour promoters.⁸³ The International Agency for Research on Cancer has listed insecticides used occupationally as carcinogens.⁸⁴ Germany, for example, has danger warnings for indoor consumer of the pest strips that contain the insecticide, dichlorvos, given its assumed risk of human cancer. However, with a paucity of epidemiologic studies on the topic, few associations of insecticides with human cancer have been established. Nevertheless, there are possible linkages of phenoxy acid herbicides with soft tissue sarcoma and malignant lymphoma; organochlorine insecticides with non-Hodgkin's lymphoma, (Fig. 40) soft tissue sarcoma, hepatic cancer, colorectal cancer, multiple myeloma, leukemia, lung cancer, and breast cancer (Fig. 41); organophosphorus compounds with non-Hodgkin's lymphoma and leukemia; and triazine herbicides with ovarian cancer.^{85, 86}

The long latency period and the lack of precise knowledge of environmental factors may have contributed to this oversight.

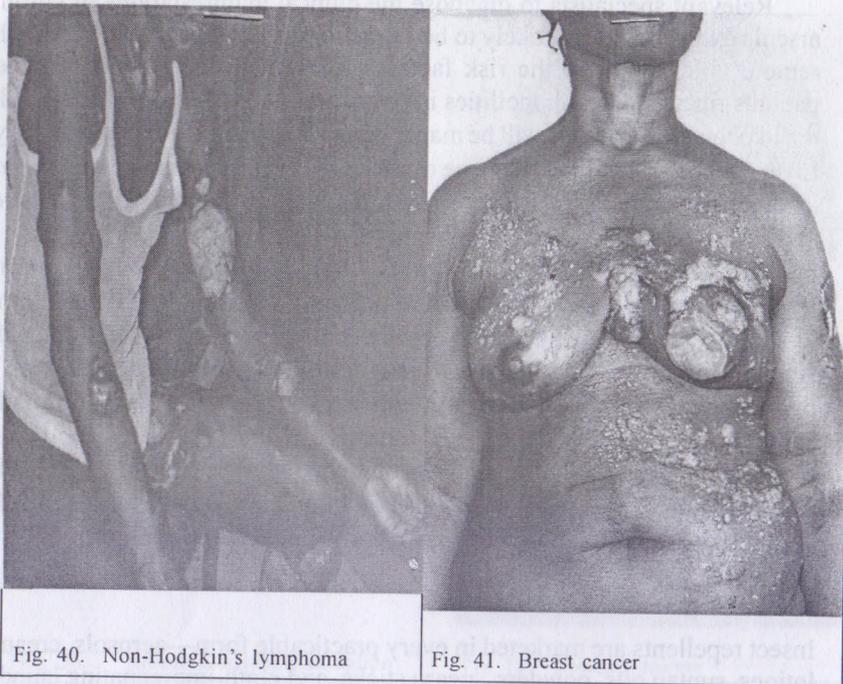


Fig. 40. Non-Hodgkin's lymphoma

Fig. 41. Breast cancer

In our world, there now exists more than 1000 compounds listed as insecticides, fungicides, herbicides, rodenticides, and antimicrobial agents that fall under the heading of pesticides. Although agriculture is the main user of these compounds, pesticides are also sprayed on urban lawns and gardens, as well as in the home. Residues of insecticides often remain on produce. Moreover, we apply them directly to our bodies (or take orally in the case of ivermectin) for the treatment parasites. Increasing concern is developing about the indiscriminate and increasing use of household, lawn, and agricultural insecticides without accompanying public education about their storage and safe use.

Rodenticides (rat poisons) and other pesticides are manufactured, packaged and sold in every nook and cranny in Nigeria, on the roads, in public transport, in the market place etc. Have these rodenticides been approved by Environmental Protection Agency (EPA)? Who will save us from the dangers? How can the millions of users be aware of EPA's guidelines for safe use of rodenticides and other pesticides? Since it is difficult, at times impossible, to prove forensically the cause — effect relationship because of the long latency period, EPA should design strategies for improving awareness of dangers, and for monitoring exposure.

◆ DERMATO-EPIDEMIOLOGY^{87,88}

Epidemiology is the study of the distribution and causes of diseases in human populations. In addition to describing the burden and causes of diseases in populations, *clinical epidemiology* is concerned with describing the natural history and prognosis of diseases and evaluating interventions which seek to prevent or treat diseases. The term dermato-epidemiology refers to the study of the epidemiology of dermatological disorders. Epidemiology is therefore relevant to dermatology for several reasons as shown in Table 12.

Table 12 The relevance of epidemiology to dermatology⁸⁷

To quantify the burden of skin disease in the community
To identify the causes of risk factors for skin diseases
To describe the natural history, prognosis and disease associations of skin diseases
To evaluate the effectiveness of dermatological health services
To provide a methodological framework for designing and interpreting clinical dermatological research

In the developing world, in particular, knowledge of the prevalence and economic impact of disease may allow the health authorities to identify those conditions that are commonest or most significant in their communities and to plan appropriate control measures where possible.

Although epidemiology is often perceived as a novel addition to dermatology, the first epidemiology discoveries in dermatology can be traced back to 1746, when James Lind⁸⁹ concluded that scurvy in sailors was related to dietary factors. He then showed by means of a controlled study, that the disease readily responded to the addition of fresh oranges and lemons in the sailor's diet.

In Nigeria, Olumide⁹⁰ observed scurvy largely among the elderly people who live alone. Other factors are poverty, ignorance, alcoholism, food faddism, and psychiatric disorders.

Vitamin C is a cofactor for proline hydroxylase in collagen synthesis. As regards the blood vessels, impaired synthesis of basal laminae, media, adventitia, and surrounding connective tissue structures compromise vessel patency. Hence, one of the skin manifestations of vitamin C deficiency is bleeding gums, oedema and purpura (bleeding) in the dependent parts of the legs (Fig. 42)

Gasper Casal described pellagra in 1762 in the Asturias region of northern Spain.⁹¹ Casal had observed that the pellagrins were all poor, subsisted mainly on maize, and rarely ate fresh meat. Several similar observations also ensued. In 1914, Joseph Goldberger⁹² observed that 8% of 418 patients



Fig. 42. Scurvy

admitted to the Georgia State Sanatorium developed pellagra compared with none of the 293 Sanatorium employees. He suggested that pellagra was due to an absence of 'essential vitamins,' today recognised as nicotinic acid, and proceeded to test his suggestions in a community trial. Goldberger and Tanner⁹³ in 1922 suggested an amino-acid deficiency as the probable cause of pellagra; Goldberger eventually solved the secret of the malady as a faulty diet and identified nicotinamide as the pellagra (PP) factor in 1926.⁹⁴ He was able to prevent and induce pellagra by dietary modification, a landmark event in the annals of medicine, nutrition, and epidemiology.

Niacin or vitamin B3 is a water-soluble vitamin, deficiency of which causes pellagra. These are generic terms for the specific vitamin nicotinic acid, as well as its natural derivative nicotinamide or niacinamide. Deficiency of niacin is either due to inadequate intake, malabsorption or some hereditary or acquired defects of the tryptophan-niacin pathway. Pellagra is endemic in some parts of Africa and Asia where maize and jowar (India millet) form the staple diet. Maize contains niacin but in a bound, unusable form; alkaline hydrolysis unbinds it. Hence, washing corn with lime water, as is done in Mexico, forestalls pellagra. Jowar (*Sorghum vulgare*) has adequate levels of usable niacin but also contains large quantities of leucine, which may inhibit nicotinamide adenine dinucleotide (NAD) production in the final steps of the niacin pathway and thus cause disease.

In Nigeria, Olumide⁹⁰ observed sporadic cases of pellagra among the Hausas, who feed predominantly on assorted grains (maize, sorghum, *jero*, *dawa*, *acha* etc). Pellagra has also been observed in recluses, elderly persons, alcohol-dependent persons, patients with psychiatric disorders, and derelicts whose dietary nutrition is inadequate, and those on antituberculous therapy with isoniazid or antimetabolites—azathioprine or 5-fluorouracil, without pyridoxine supplements.

Although pellagra is classically manifested by the triad — dermatitis, diarrhoea, and dementia, the latter two manifestations are commonly found in advanced cases. The presenting symptom is almost always a dermatitis, which is a photo-dermatitis, (sun induced) hence the exposed areas are maximally affected. It begins in the neck, like a scarf tied around the neck, and tapers downwards — 'Casals necklace' (Fig. 43).

Apart from protein-energy malnutrition — kwashiorkor, (Fig. 44) and manifestation of total starvation — marasmus, commonly seen in refugee camps, features of vitamin-A deficiency are often seen particularly among children of pre-school age. Corneal lesions immediately threatening sight are seen in extreme conditions such as in refugee camps. The classic cutaneous manifestation of Avitaminosis A is a follicular hyperkeratosis when the skin appears like a toad skin. Spinous papules appear at the tips of hair follicles, symmetrically distributed initially at the extensor surfaces of the thighs and forearms, particularly the elbows, (Fig. 45) knees and buttocks. These follicular changes occur on a background of generally dry and rough skin, hence the skin feels like sandpaper or a nutmeg grater. In longstanding cases, some areas of dry scales may exfoliate to leave mild post-inflammatory hypopigmentation.

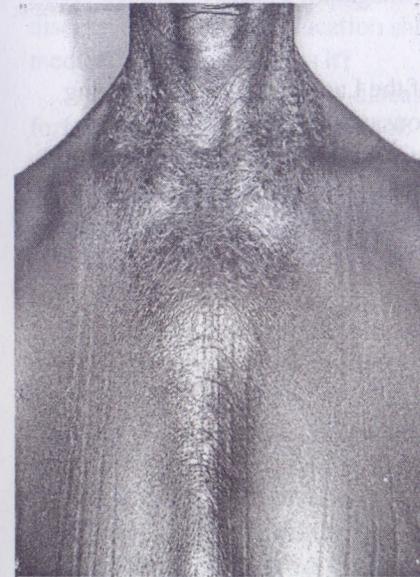


Fig. 43 Casal's necklace in pellagra



Fig. 44 Kwashiorkor



Fig. 45. Phrynoderma

Recovery is often impressive when the nutritional state is improved by cod-liver oil, palm oil, carrots, green vegetables, fruits, and offals such as liver. Uncooked palm oil is a rich source of vitamin A, hence patients are advised to take it with staple foods like yam, plantain, and beans. About three out of every ten children seen in our clinic do present with skin signs of vitamin A deficiency.

Simply stated, epidemiology is the simplest and most direct method of studying the causes of diseases in humans and many contributions have been made by studies that have demanded nothing more than an ability to count, to think logically and to have an imaginative idea.

Incidence of skin diseases in Nigeria

In a most recent study⁹⁵ in the skin clinic of the Lagos University Teaching Hospital (LUTH), a total of 9,305 (nine thousand, three hundred and five) new cases consulted the Out Patient Skin Clinic between March 2000 to October 2003. Table 13 shows the Top Ten groups of diseases.

Table 13 Top ten groups of skin disease in LUTH

Disease groups	Percentage
1. Papulosquamous eruptions	14.14
2. Fungal infections	12.31
3. Contact and Occupational Dermatitis	7.42
4. Parasitic infestations	7.37
5. Acne keloidalis nuchae	6.03
6. Autoimmune diseases	6.10
7. Bacterial infections	5.82
8. Atopic eczema	5.20
9. Pigmentary disorders	5.03
10. HIV/AIDS Associated diseases	4.37

In the latter half of the last century when dermatologic literature emerged from Nigeria, 65-70% of patients seeking medical help for skin afflictions had communicable diseases.⁹⁶⁻¹⁰⁰

It becomes clear that with industrialization/urbanization and emergence of HIV/AIDS, there is associated change in the pattern of skin diseases.

This trend in the frequency of skin diseases will have tremendous impact in the training curriculum, the essential drug list (EDL) and health policies in Nigeria.

◆ TRAINING OF HEALTH CARE PROVIDERS IN DERMATOLOGY: CAPACITY BUILDING

Undergraduate medical education

Previous studies have shown that approximately 6.5% of adult and pediatric outpatients present with a primary condition involving the skin or mention a skin problem as a secondary complaint. Because the majority of patients with a cutaneous problem are not initially seen by a dermatologist, it is obvious that persons choosing primary care medicine as a career will increasingly be caring for patients with skin disorders. To provide these future primary care physicians with an understanding of the skin and its disease, dermatologic education should be prominent within undergraduate medical education—but is it?

Attitudes towards skin diseases and dermatology are by and large formulated during medical school. Assuring that effective education about the skin is conducted in medical school is crucial if we are to (1) provide appropriate medical care for the Nigerian public, (2) attract students to the specialty of dermatology, (3) ignite and maintain interest in dermatologic research, and (4) foster and perpetuate interdisciplinary respect and collaboration.

The skin is a striking and readily available indicator of serious disease: even an untrained observer can recognize the pale appearance of a patient in shock, or the cyanosis associated with cardiac failure, or jaundice as the first sign of obstructive biliary disease. However, the physician must also be able to detect the more subtle skin signs of life-threatening diseases. Physicians must know enough about skin lesions to be able to decide which lesions to overlook. Examination of the skin is an acquired skill. Physicians must train themselves to become good “noticers”, to become “visually literate”.

The main thrust of a new initiative of the International League of Dermatological Societies (ILDS) is to integrate care of skin disease into the primary health care system. Project UNIDERM is an important step in this direction, logical because of the great burden of skin disease in the developing world. Experience and data show that a large proportion of visits to health clinics in developing countries is for skin disease.

Providing for prevention and care of common skin diseases in communities in Nigeria can build confidence in the primary health services (thus providing financial sustainability), and provide a contact point for health education designed to reduce the burden of skin disease in the future.

It is not hyperbole to state that the most exploited patients by quacks are patients with skin diseases and sexually transmitted diseases (STD). Assorted remedies are being prescribed and advertised for skin diseases and “staphylococcal” STD — a disease that does *not* exist! One of the ways to attenuate such exploitation is to empower more health care providers to *correctly* manage such patients.

The harsh reality is that it is still possible to graduate from a medical school in Nigeria without ever receiving any significant education about the skin or about cutaneous diseases. In light of these findings, the following are being suggested:

1. The development of a “core curriculum” that can be used in planning curricular content.
2. The development of a generic syllabus for medical students that contains basic information about the anatomy and histology of the skin as well as the pathology and pathophysiology of the most common fifteen to twenty skin disorders in Nigeria. The emphasis would be on fundamental concepts of diagnosis and management of the conditions, with management to include initial treatment and appropriate referral patterns. This syllabus could either be distributed to each medical student or could perhaps be made available more economically via the Internet.

Medical education in Nigeria today continues to emphasize the importance of producing primary care physicians to serve the needs of the population. Generalist physicians encounter cutaneous disease on a daily basis and will continue to provide a significant amount of primary care in Nigeria. The fundamental principles of cutaneous biology and the recognition and understanding of common cutaneous disorders should be part of the required undergraduate curriculum in every medical school in Nigeria. Only by having an awareness and appreciation for the breadth, diversity, and complexity of cutaneous disease can the necessity for a specialized niche for dermatology be fully appreciated.

Training of nurses

In Nigeria and in most African countries, nurses are the sole health care providers in primary health care centres, school clinics, some industrial clinics and in-house clinics in the work place. Therefore, the training of nurses should not end with just the conventional training for bed side nursing. Nurses should be empowered to manage the common skin disorders appropriately. There is also the need to develop a generic syllabus for the training of nurses.

Continuing Medical Education (CME)

What should be done to the thousands of general medical practitioners, most of whom believe that “fungal infection” is a generic name for all skin diseases? Some of these doctors are not really to blame because they have graduated from medical schools without ever receiving any significant education about the skin or about skin diseases.

Continuing medical education is an indispensable tool for all practising doctors, irrespective of specialty, but even more critical for the generalists. Relevant courses are often mounted by the various colleges of medicine, teaching hospitals, and postgraduate medical colleges. It is imperative that all practitioners, interested in credible quality care for their patients, avail themselves of such courses.

It is gratifying to state that the consultancy service of the College of Medicine, University of Lagos—MEDILAG CONSULT—has already commenced CME courses in HIV/AIDS, Genitourinary medicine (Venereology) and General dermatology. The four-week course for doctors will be run every year, and this will be followed yearly by another four-week course for nurses. The initial faculty staff are currently four Dermatologists from four Medical Schools in Nigeria. It is hoped that all family physicians (general practitioners), and nurses in both public and private sectors will avail themselves of this opportunity to improve knowledge, attitude and skills. Furthermore, companies who care for quality care of their workers should sponsor their doctors and nurses to such CME courses, and may choose to make evidence of CME among some hospital staff a prerequisite for renewal of medical retainership of health care providers.

Diploma course in dermatology

At present, there are only about twenty-eight dermatologists certified as specialists by the Medical Council in Nigeria and these are the teachers in the subject. This number is grossly inadequate for the whole country. The

current postgraduate training in dermatology takes a minimum of five years for a candidate who does not have to repeat any of the examinations (Primary, Part I and Part II). Furthermore, only about one or two specialists graduate annually from both the National and West African Postgraduate Medical Colleges. The vast majority of the patients seen in the clinics at tertiary health care facilities are patients with skin diseases which could have been effectively managed by the Primary and Secondary Health care providers. There is therefore a need for intermediate manpower training to offer credible dermatological services at the lower levels of health care.

A Diploma or Masters course of just one academic year, well structured, will serve the purpose, and this will be proposed to the Senate of the University of Lagos when appropriate number of teachers in the subject are appointed.

Teledermatology as a new tool in sub-Saharan Africa

Large areas of sub-Saharan Africa suffer a substantial lack of skin care. Hence teledermatology, meaning the on-line visual exchange of clinical and histologic data, could develop into a powerful medical resource.

Teledermatology has been shown to be a useful tool in providing skin care to medically underserved populations.¹⁰¹ In areas like sub-Saharan Africa, which suffer from a scarcity of dermatologists as well as limited means of communication and transportation, its seemingly obvious potential has been repeatedly discussed. A complete hardware and software package are required (desktop PC, still digital camera, modem, telecommunication software), and of course, in Nigeria, — a telephone line, a stabilizer and UPS.

Dermatology textbooks

The standard textbooks of dermatology for the specialists worldwide are massive books that come in volumes of two to four. For example the last edition of Rook\Wilkinson\Ebling is a four-volume book of 3,700 pages. The books for specialist training are very expensive books and some of them cost as much as £700 (Seven hundred pounds sterling). These books could overwhelm anyone being initiated into the subject. More importantly, they are hardly necessary for health care providers at the lower levels of health care. Hence, the relevant and affordable textbooks in *Dermatology*; *HIV/AIDS*; and *STD* for Primary and Secondary health care providers have been made available for learners.

Olumide YM. *A Pictorial Self-instructional Manual on Common Skin Diseases* - Published by Heinemann.

Olumide YM. *A Self-instructional Manual on HIV/AIDS* - Published by LONGMAN.

Olumide YM. *A Self-instructional Manual on STI* - Published by LONGMAN.

Need for a National Book Policy

A very serious phenomenon now in Nigeria is that *some* Publishing houses now prefer autobiographies of wealthy visible personalities who can fund the printing of the books to which publishing firms simply tag their names so that they can identify with the project, particularly on the day of the book launch, purely for fiscal reasons. This is a most unhealthy trend inimical to the growth of tertiary education in Nigeria, as committed academics are least likely to be able to afford such funds.

There are colleagues in other specialties who have written or are eager to write relevant tertiary textbooks, but who have been discouraged because of the difficulty in getting credible publishers who will not only fund the printing but also possess the necessary infrastructural network for distribution and sale.

I am also aware that the Nigerian Academy of Science (NAS) and the National Universities Commission (NUC) have entered into dialogue to engage in a collaborative effort to tackle the problem of National Book Policy. The support of all stake holders will no doubt help to provide the enabling environment for the successful take off and implementation of this laudable project.

◆ DERMATO-VENEREOLOGY IN THE HOLY BIBLE

(1) Medications in the Holy Scriptures

- Balm of Gilead

*"Is there no balm in Gilead, Is there no physician there?
Why then is there no recovery, For the health of the daughter of my people?" (Jer. 8:22)*

- Hezekiah's poultice

"Now Isaiah had said, "Let them take a lump of figs, and apply it as a poultice on the boil, and he shall recover." (Is. 38:21)

- Pool of Bethesda and the lame man

³*"In these lay a great multitude of sick people, blind, lame, paralyzed, waiting for the moving of the water. ⁴For an angel went down at a certain time into the pool and stirred*

up the water; then whoever stepped in first, after the stirring of the water, was made well of whatever disease he had." (Jn. 5:3, 4)

"Jesus said to him, "Rise, take up your bed and walk." (Jn. 5:8)

- Clay and pool of Siloam and "a man who was blind from birth"
6 "He spat on the ground and made clay with the saliva; and He anointed the eyes of the blind man with the clay. 7 And He said to him, "Go, wash in the pool of Siloam" (which is translated, Sent). So he went and washed, and came back seeing." (Jn. 9:6, 7)

- Prayer and anointing oil

"...and anointed with oil many who were sick, and healed them." (Mk. 6:12)

14 "Is anyone among you sick? Let him call for the elders of the church, and let them pray over him, anointing him with oil in the name of the Lord. 15 And the prayer of faith will save the sick, and the Lord will raise him up. And if he has committed sins, he will be forgiven." (James 5:14, 15)

- Naaman healed of leprosy

"Go and wash in the Jordan.....and his flesh was restored like the flesh of a little child, and he was clean." (2 Kgs 5:10, 14)

However, we are not expected to rely on medications alone; we must also pray to God for healing.

"And in the thirty-ninth year of his reign, Asa became diseased in his feet, and his malady was severe; yet in his disease he did not seek the LORD, but the physicians."

(2 Chr. 16:12)

Consulting physicians and using medications are perfectly scriptural. What Asa did wrong was consulting physician to the total exclusion of God. God is the healer. Know that it is God "who heals our diseases" (Ps. 103:3). He is also the God of science who has provided the raw materials for the drugs (Jer. 8:22; Rev. 22:2) though He has all the power and authority to heal us even without drugs. "And He cast out the spirits with a word,....." (Mt. 8:16)

"But only speak a word, and my servant will be healed." (Mt. 8:8)

"For with authority and power He commands the unclean spirits, and they come out."

(Lk. 4:36)

He still wants us to do our own bit (Ex. 14:15; Jos. 7:10).

Furthermore, since all the medications documented in the Holy Scriptures were topical preparations, it buttresses the fact that the skin is not just an inert covering but that substances (chemicals and physical agents) are absorbed through the skin. Indeed an increasingly popular method of drug delivery today is "transdermally." Medications to prevent sea-sickness or to treat angina are placed in an adhesive disc for delivery through the skin.

(2) Leprosy ¹⁰²⁻¹⁰⁵

Reminiscing under the title *Skin Diseases: contagion and sin in the Old Testament*. Lieber¹⁰² observed that skin diseases are frequently designated as "tsarā' at:" a Hebrew expression denoting a condition that also affected clothing and dwellings. Read the Law of leprosy in Lev. 14:34, 35, 37, 38, 54-57.

The actual meaning of the word *tsarā' at* is not known, but since the 3rd century B.C., when it was translated in the Greek Septuagint as "lepra", it has almost invariably been rendered as "leprosy", although the Greek term merely signifies "scaly" or "rough". However, in all the Biblical portions where the clinical feature of the disease in man was described it was "white as snow" and it was a contagion. Hypopigmented patches and contagion are qualities applicable to true leprosy (Hansens' disease) today, and tuberculoid leprosy is scaly and rough (Figs. 46-49).

Could leprosy really infect one's clothing or house? The Hebrew word for leprosy included a variety of skin diseases as well as other molds and fungi. The "leprosy" found on clothing or house walls was more like a mildew, mold, fungus, or bacteria. There were specific cleansing procedures designated for mildewed clothing and buildings. These were fully required by the law (Lev. 14:44-57). Why was mildew so dangerous? This fungus could spread rapidly and promote disease. It was therefore important to check its spread as soon as possible. In extreme cases, if the fungus had done enough damage, the clothing was burned or the house destroyed. This may refer to the ubiquitous molds that cause *Mucormycosis*.¹⁰⁶ These are molds of the order Mucorales of the class Zygomycetes. They characteristically are acute, rapidly developing, often fatal opportunistic infections of immunocompromised patients. Most occur in ketoacidotic diabetes, but leukemia, lymphoma, AIDS, iatrogenic immunosuppression, burns, chronic renal failure, and malnourishment all predispose to these infections. Occasionally, healthy individuals have been reported to develop these infections.

The five major clinical forms (rhinocerebral, pulmonary, cutaneous, gastrointestinal, and disseminated) share features that include invasion of blood vessel walls by organisms. This leads to infarction, gangrene, and the formation of black, necrotic pus. Ulceration, cellulitis, ecthyma gangrenosum-like lesions, and necrotic abscesses constitute the usual cutaneous appearance. It may involve the skin through traumatic implantation or by hematogenous dissemination.

God told the Israelites how to diagnose leprosy so they could avoid it or treat it. These laws were given for the people's health and protection.

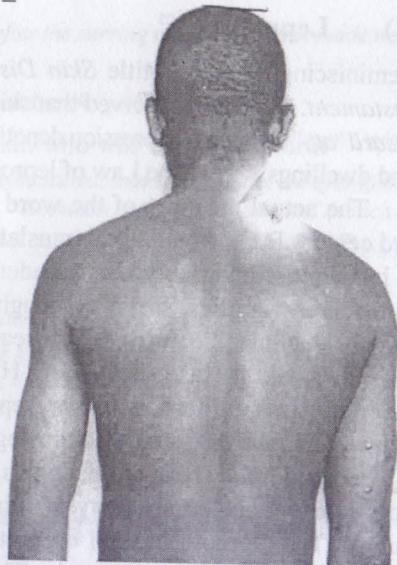
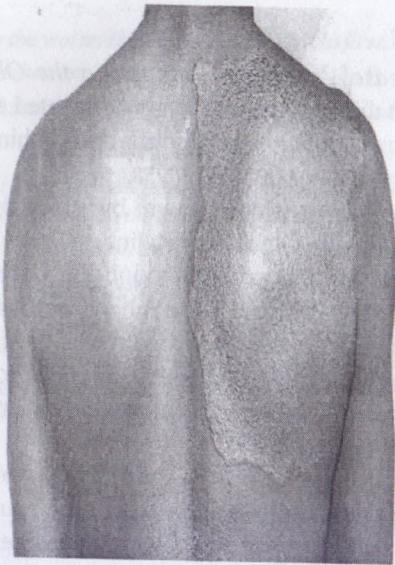


Fig. 46. Leprosy

Fig. 48. Leprosy



Fig. 47. Leprosy

Fig. 49. Leprosy

They helped the Israelites avoid diseases that were serious threats in that time and place. Although they would not have understood the medical reasons for some of these laws, their obedience to them made them healthier. Many of God's laws must have seemed strange to the Israelites. His laws, however, helped them avoid not only physical contamination, but also moral and spiritual infection.

The Word of God still provides a pattern for physical, spiritually, and morally healthy living. We may not always understand the wisdom of God's laws, but if we obey them, we will thrive. Does this mean we are to follow the Old Testament health and dietary restrictions? In general, the basic principles of health and cleanliness are still healthful practice, but it would be legalistic, if not wrong, to adhere to each specific restriction today. Some of these regulations were intended to mark the Israelites as different from the wicked people around them. Others were given to prevent God's people from becoming involved in heathen religious practices, one of the most serious problems of the day. Still others related to quarantines in a culture where exact medical diagnosis was impossible. Today, for example, physicians can diagnose the different forms of leprosy, and they know which ones are contagious. Treatment methods have greatly improved, and quarantine for leprosy is rarely necessary. However, the basic principles of quarantine and fumigation of buildings to stem the tide of communicable diseases still apply today in medical practice e.g. SARS. Leprosy is largely a droplet (airborne) disease as the organism *M. leprae* cannot penetrate intact skin except there is an abrasion, cut or ulcer. The organism however can penetrate mucous membranes e.g. of the respiratory passage.

In conclusion, leprosy, a name applied to several different diseases, was greatly feared in Biblical times. It had a similar emotional impact, terror and opprobrium associated with it as AIDS does today. Some of these diseases, unlike the disease we call leprosy or Hansen's disease today, were highly contagious. The worst of them slowly ruined the body and, in most cases, were fatal. Lepers were separated from family and friends and confined outside the camp (quarantined). Since priests were responsible for the health of the camp, it was their duty to expel and readmit lepers. If someone's leprosy appeared to go away, only the priest could decide if he was truly cured. Leprosy is often used in the Bible as an illustration of sin because sin is contagious and destructive and leads to separation. Since we all have the incurable disease—sin, (Rom. 3:10-20; 1Jn. 1:8-10) only Christ's healing touch can miraculously take away our sins and restore us to real living. But first, just like the leper in Matthew 8:2, 3, we must realize our inability to cure ourselves and ask for Christ's saving help.

Leprosy is mentioned in various passages in the Scriptures as follows:

- To demonstrate God's power—Exodus 4:6-7
- To provide a pattern for living physically, spiritually, and morally healthy lives—Leviticus 14:54-57
- Punishment for rebellion—Miriam (Nm. 12:10-14); Uzziah (2 Chr. 26:16-23)
- To demonstrate blessings in humility and obedience—Naaman (2 Kgs. 5:1-4)
- To illustrate Christ's saving grace—Mt. 8:2, 3.

(3) Circumcision

"This is My covenant which you shall keep, between Me and you and your descendants after you: Every male child among you shall be circumcised; and you shall be circumcised in the flesh of your foreskins, and it shall be a sign of the covenant between Me and you."

(Gen. 17:10, 11)

God did *not* prescribe circumcision for women!

Also read **Jer. 4:4; 9:25, 26**

Why did God require circumcision? (1) As a sign of obedience to him in all matters. (2) As a sign of belonging to his covenant people. Once circumcised there was no turning back. The man would be identified as a Jew forever. (3) As a symbol of "cutting off" the old life of sin, purifying one's heart, and dedicating oneself to God (**Dt. 10:16**). (4) Possibly as a health measure.

Circumcision more than any other practice separated God's people from their heathen neighbors. In Abraham's day, this was essential to develop the pure worship of the one true God. Other cultures at that time used circumcision as a sign of entry into adulthood but only Israel used it as a sign of following God. The spiritual significance of circumcision to Christians is given below:

"In Him you were also circumcised with the circumcision made without hands, by putting off the body of the sins of the flesh, by the circumcision of Christ." (**Col. 2:11**)

"For in Christ Jesus neither circumcision nor uncircumcision avails anything, but a new creation." (**Gal. 6:15**).

Living a good life without an inward change leads to a shallow or empty spiritual walk. What matters to God is that we be completely changed from the inside out by living in vital union with Christ (**2 Cor. 5:17; Col. 2:6, 7, 11, 12**).

There are also medical indications for circumcision—viz for phimosis, to prevent cancer, since the preputial skin is cancer prone, for hygienic purposes, and to reduce transmission of sexually transmitted diseases and HIV/AIDS.

Herpes and syphilis are more common in uncircumcised men.¹⁰⁷⁻¹¹² Furthermore, the presence of a foreskin predisposes both heterosexual and

homosexual men to the acquisition of HIV.¹¹⁰⁻¹¹² Infectious agents of herpes, syphilis, and AIDS depend on a break or an abrasion in the skin to gain entry into the body and this mode of transmission is amplified when the skin surface is a delicate, easily abraded penile lining, such as the mucosal inner layer of the foreskin, than when the foreskin is absent. Studies have shown that the redundant prepuce may be as long as 7.6cm in some cases. Thus the inner mucosal lining can represent nearly 50 percent of the surface area of the shaft when the penis is erect, and this provides a larger surface area of contact with the inoculum, and since it is more susceptible to traumatic epithelial disruption during sexual intercourse, there is increased risk that infectious agents will be acquired through a skin break. Minor inflammatory conditions, such as balanitis are common in uncircumcised men; this coupled with the accumulation of smegma praeputii might lead to recruitment of inflammatory HIV-1 target cells to the exposed epithelium or could act as a physical portal of entry.

(4) Job's disease

The book of Job is a gripping drama of riches-to-rags-to-riches, a theological treatise about suffering and divine sovereignty, and a picture of faith that endures. Job a wealthy and upright man, loses his possessions, his children, and his health. Job did not understand why he was suffering. His three friends told him that sin caused his suffering, and that he should confess his sins and turn back to God. But Job maintains his innocence. A fourth voice—the young Elihu—enters the debate in a similar misguided manner. Finally, God speaks out of a mighty whirlwind confronted with the great power and majesty of God, Job falls in humble reverence before God—speechless. God rebukes Job's friends, and the drama ends with Job restored to happiness and wealth. It is easy to think that we have all the answers or explanations to lives problems. In reality, only God knows exactly why things happen as they do, and we must submit to him as our Sovereign.

To date there has not been a completely satisfactory diagnosis presented to explain all the clinical manifestations of Job's illness. The first sign refers to covering Job from the crown of his head to the soles of his feet with boils. The original Hebrew word for boils is the inflammatory condition known as *schechin*. It is mentioned in **Exodus 9:8-12** as one of the 10 Egyptian plagues as well as being mentioned in **Leviticus 14:18, 20, 23** as one type of biblical leprosy. When used in the above contexts, *schechin* is a more general dermatologic term that refers to erythema and inflammation.

Gorman and Kaplan¹¹³ tried to decipher the nature of the illness of Job and came out with the features in Table 14. There are six clinical symptoms and signs within the Biblical description of Job's illness.

Table 14 Correlation of the Bible verses from the Book of Job with signs and symptoms

Biblical chapter and verse	Symptoms and signs
	"Painful boils" and
Symptom	
2:8	Pruritus
7:4, 30:17	Insomnia
19:17	Halitosis
30:17, 33:19	Nocturnal deep-seated pain
30:27	Abdominal cramps,
	borborygmus
33:20	Anorexia
Signs	
2:7	Generalized erythroderma
7:5	Exfoliative dermatitis
16:8, 19:20, 33:21	Weight loss
30:30	Diffuse hyperpigmentation
30:30	Fever
7:19	Dysphagia

Job's syndrome in Dermatology literature

Job's syndrome in current Dermatology literature is a subset of hypergammaglobulinemia E syndrome, which occurs mainly in girls with red hair, freckles, blue eyes, and hyperextensible joints and cold abscesses. The disorder is thought to be autosomal dominant with variable expressivity, many patients show partial phenotype.^{114, 115}

Hyperimmunoglobulin E Syndrome consists of atopic-like eczematous dermatitis, recurrent pyogenic infection (frequently in the lungs and skin), high levels of serum IgE, elevated IgD levels, IgE antistaphylococcal antibodies, peripheral eosinophilia, and defective neutrophil chemotaxis. The disease is chronic and begins early in life (two months to two years of age). In addition to atopic dermatitis like eczema, many of the lesions look like papular prurigo, there may be palmo-plantar keratoderma, ichthyosis, urticaria, asthma, and chronic mucocutaneous candidiasis. Furuncles, carbuncles, (boils) and abscesses of variable severity, as well as chronic nasal discharge and recurrent otitis media are common. Patients develop progressive coarsening of facial features.¹¹⁶⁻¹¹⁸

Let us now examine the similarities or differences between the Biblical Job's illness and the Job's syndrome in dermatology literature.

As regards age of onset of illness.

¹⁶ "After this Job lived on hundred and forty years, and saw his children and grandchildren for four generations. So Job died, old and full of days." (Job 42:16, 17)

Though we are not told how old Job was at the time of onset of illness, we know he was an adult with a wife and children. We are also told that he lived till very old age. However, Job's syndrome in the medical literature occurs in early childhood, mainly in girls, who usually succumb to death within the first decade of life from overwhelming infection. As regards the clinical presentation, all the symptoms and signs in Biblical Job's disease are demonstrable in modern Job's syndrome.

However, just as the Bible Job could not explain *why* he suffered, neither today's physicians nor the innocent children who suffer from Job's disease can explain *why* these children are born to suffer from the disease. Furthermore, as at today, there is really no cure for dermatological Job's disease apart from symptomatic management. Just as God cured the biblical Job's disease, the question that may be asked now is

"Is anything too hard for the LORD?" (Gn. 18:14)

Job himself acknowledged this eternal truth

"I know that You can do everything." (Job 42:2)

Hence, modern Job's disease is just one of the numerous occasions when specialists bury their pride in humble submission to God's miraculous healing power!

(5) Sexually Transmitted Diseases

Today medical science recognises more than twenty different diseases that are transmissible through sexual intercourse. All these diseases are transmitted simply through the exchange of body fluids. In Leviticus chapter 15, God gave several instructions on purification after bodily discharges in both men and women.

¹⁸ "Also, when a woman lies with a man, and there is an emission of semen, they shall bathe in water, and be unclean until evening.....³²This is the law for one who has a discharge, and for him who emits semen and is unclean thereby, ³³and for her who is indisposed because of her customary impurity, and for one who has a discharge, either man or woman, and for him who lies with her who is unclean." (Lev. 15:18, 32, 33)

These verses do not imply that sex is dirty or disgusting. God created sex for the enjoyment of married couples as well as for continuing the race and continuing the covenant. Everything must be seen and done with a view toward God's love and control. Sex is not separate from spirituality and

God's care. God is concerned about our sexual habits. We tend to separate our physical and spiritual lives, but there is an inseparable intertwining. God must be Lord over our whole selves—including our private lives.

God is concerned about health, the dignity of the person, the dignity of the body, and the dignity of the sexual experience. His commands call the people to avoid unhealthy practices and promote healthy ones. To wash was the physical health response, to be purified or cleansed was the spiritual dignity response. This shows God's high regard for sex and sexuality. In our day, sex has been degraded by publicity; it has become public domain, not private celebration. We are called to have a high regard for sex, both in good health and purity.

Read **Leviticus 18:6-18**. Marrying relatives was prohibited by God for physical, social, and moral reasons. Children born to near relatives may experience serious health problems. Without these specific laws, sexual promiscuity would have been more likely, first in families, then outside. Figure 50 shows lamellar ichthyosis, an autosomal recessively inherited disease transmissible through incestuous consanguinous marriages. Indeed there are hundreds of very serious diseases transmissible through consanguinity which time will not permit me to mention today. Improper sexual relations destroy family life.



Fig. 50. Lamellar ichthyosis

Several abominations, or wicked actions, are listed in **Leviticus 18**: (1) having sexual relations with close relatives, (2) committing adultery, (3) offering children as sacrifices, (4) having homosexual relations, and (5) having sexual relations with animals. These practices were common in heathen religions and cultures, and it is easy to see why God dealt harshly with those who began to follow them. Such practices lead to disease, deformity, and death. They disrupt family life and society and reveal a low regard for the value of oneself and of others. Society today takes some of these practices lightly, even trying to make them acceptable. But they are still sins

in God's eyes. If you consider them acceptable, you are not judging by God's standards.

Table 15 shows the spectrum of abominable sexual practices listed in the Holy Scriptures.

Table 15 *What is sexual sin?*

Sexual sin is any sexual act forbidden by God.

Adultery:	<i>Exodus 20:14; Lv. 18:20 Lv. 20:10; divorce = adultery Mt. 5:32</i>
Pre-marital sex: (Fornication):	<i>Deuteronomy 22:20, 21; Song of Solomon 2:7; 4:12</i>
Rape:	<i>Deuteronomy 22:25, 26 (the rapist; not the victim)</i>
Incest:	<i>Leviticus 18:6-18; 20:11,12,17,19-21</i> <i>Deuteronomy 22:30;27:20-23; Ezekiel 22:11; 1Cor 5:1</i>
Prostitution:	<i>Deuteronomy 23: 17-18</i>
Homosexuality and Lesbianism	<i>Leviticus 18:22; 20:13; Romans 1:26, 27; 1Corinthians 6:9, 10; 1 Timothy 1:10</i>
Transverstism:	<i>Deuteronomy 22:5</i>
Bestiality:	<i>Leviticus 18:23; 20:15,16; Dt. 27:21</i>
Lust:	<i>Matthew 5:27-28; Romans 13:12-14; 1 Jn 2:16, 17</i>
Lewdness:	(coarse or crude jesting, indecent, obscene songs/jokes referring to sex in a crude or offensive way) <i>Galatians 5:19; Colossians 3:8; Ephesians 4:19, 31; 5:4</i>
Indecent dressing:	<i>1 Timothy 2:9-10; 1 Peter 3:2-4.</i>
Sex during mensis:	<i>Lv. 18:19</i>

"Defraud" (*GK pleonekteo*) means to deprive another of the moral purity and chastity that God desires for that person in order to satisfy one's own self-centered desires. To arouse sexual desires in someone which cannot be righteously fulfilled is defrauding that person. (**1 Thes. 4:3-8**).

Sexually immorality and impurity include not only forbidden intercourse or consummated acts, but also involve any act of sexual gratification with another person other than one's marriage partner.

The gravity of sexual sin

Sexual immorality is against God's law. It hurts God because it shows that we prefer following our own desires instead of the leading of God. (**1 Thes. 4:8**). It hurts others because it violates the commitment so necessary to a relationship. Spouses are devastated. It shatters the mutual commitment of married partners. Children are scared. The partners themselves, even if they escape disease and unwanted pregnancy, lose their ability to fulfill commitments, to feel sexual desire, to trust, and to be entirely open with another person. It destroys the sanctity of the family. It destroys family life. It erodes a person's ability to love. It has devastated countless lives and destroyed families, churches, communities, and even

nations because it destroys the integrity on which these relationships are built.

It degrades human beings and turns them into objects. It twists people's mental well-being. It can result in unwanted children, and murder (abortion). It can lead to diseases with serious complications e.g. AIDS, ectopic pregnancy, infertility (in both men and women), recurrent miscarriages, ano-genital cancers (in both men and women); and even death, also serious diseases in the new-born including blindness. Sexually transmitted diseases like syphilis, AIDS, hepatitis viruses are transmissible to innocent people e.g. babies, spouses, and other patients through blood transfusion, and at times to medical personnel while caring for infected patients.

God's laws are not arbitrary. They do not forbid good, clean fun; rather, they warn us against destroying ourselves through unwise actions or running ahead of God's timetable. God designed marriage and sanctified it, and only within this covenant relationship can we find real love and fulfillment. God does not intend faithfulness in marriage to be boring, lifeless, pleasureless, and dull. Sex is a gift God gives to married people for their mutual enjoyment. (**Prv. 5:18-20; Heb 13:4**)

Real happiness comes when we decide to find pleasure in the relationship God has given or will give us and to commit ourselves to making it pleasurable for our spouse. Don't let God's best for you be wasted on the illusion of greener pastures somewhere else. Instead, rejoice with your spouse as you give yourselves to God and to each other. The real danger is in doubting that God knows and cares for us. We then may resent his timing and carelessly pursue sexual pleasure without his blessing. Sexual sin has always been widely available, and the glorification of sex between people who are not married to each other often hides deep tragedy and hurt behind the scenes. When society portrays sexual sin as attractive, it is easy to forget the dark side. God has good reasons for prohibiting sexual sins: He loves us and wants the very best for us.

Note carefully! No unrepentant sexually immoral person will enter heaven:

"But the cowardly, unbelieving, abominable, murderers, sexually immoral, sorcerers, idolaters, and all liars shall have their part in the lake which burns with fire and brimstone, which is the second death." (**Rv. 21:8**).

(6) HIV/AIDS in the Holy Bible

All the clinical manifestations of HIV/AIDS have been predicted in the Holy Scriptures.

Deuteronomy 28

²¹"The Lord will plague you with diseases until he has destroyed you. ²²The Lord will strike you with wasting diseases, with fever and inflammation, ²⁷The Lord will afflict you with the boils of Egypt and with tumours, festering sores and the itch, from which you cannot be cured. ²⁸The Lord will afflict you with madness, blindness and confusion of mind. ²⁹At midday you will grope about like a blindman in the dark. ³³The Lord will afflict your knees and legs with painful boils that cannot be cured, spreading from the soles of your feet to the top of your head. ³⁷You will become a thing of horror and an object of scorn and ridicule. ³⁹The Lord will send fearful plague on you and your descendants, harsh and prolonged disasters, and severe and lingering illnesses.

⁶⁰He will bring upon you all the diseases of Egypt that you dreaded, and they will cling to you. ⁶¹The Lord will also bring on you every kind of sickness and disaster not recorded in this Book of the Law, until you are destroyed. ⁶²You who were numerous as the stars in the sky will be left but few in number, because you did not obey the Lord your God. ⁶³Just as it pleased the Lord to make you prosper and increase in number, so it will please him to ruin and destroy you."

All the above are classical descriptions of the clinical manifestations of AIDS ¹¹⁸⁻¹²⁶

Vs.²¹ "plague"

The medical literature has labelled AIDS as "the plague of the millenium." The ancient plagues occurred when Pharaoh's hardened heart and disobedience brought ten plagues to Egypt. (**Exodus Chapters 7-11**). The third plague was when all the dust of Egypt became a massive swarm of lice, and *itching* is the hallmark of infestation by lice. The sixth plague was when horrible boils broke out on everyone in Egypt and is referred to as the "*boils of Egypt*".

Vs.²² "*wasting diseases, (Fig. 51) fever and inflammation.*" Wasting (loss of weight) is also known as "slim disease"; unexplained *fever* and a host of inflammatory diseases (opportunistic infections) are classical manifestations of AIDS.

Vs. ²⁷ "*boils of Egypt*" (Fig. 52) and "*tumours*", (Fig. 53) "*festering sores*" (Fig. 54) and the "*itch*", which cannot be cured. "*Boils of Egypt*", numerous AIDS - related skin diseases present as "boils" in AIDS patients e.g. molluscum contagiosum, cutaneous cryptococcal infection, candidal folliculitis, bacillary angiomatosis, herpes zoster and simplex, histoplasmosis and protothecosis. "*Tumours*": Kaposi's sarcoma and various lymphomas; "*festering sores*": ecthyma gangrenosum, chancroid etc. present as sores. Pruritus ("*itch*") is of course a notable manifestation of AIDS prurigo, pruritic papular eruption (PPE) of HIV and eosinophilic folliculitis.

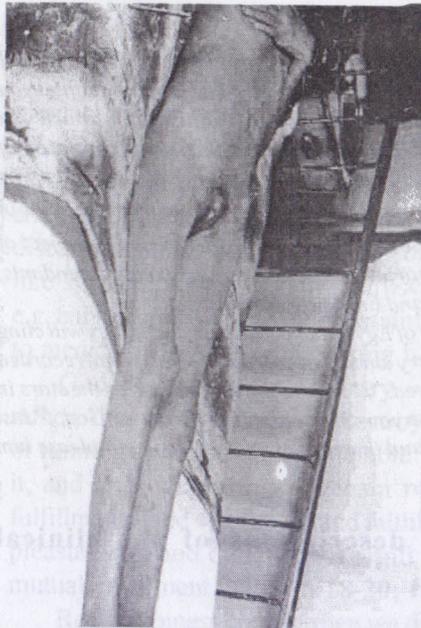


Fig. 51. Wasting in AIDS "wasting disease"



Fig. 53. Kaposi's sarcoma "tumours"



Fig. 52. Herpes zoster "Boils"

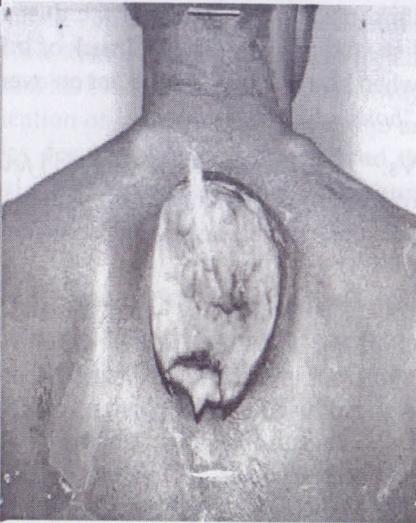


Fig. 54. Ecthyma gangrenosum
"Festering sores"

Vs²⁸ "madness" "confusion of mind" = AIDS dementia.

Vs²⁹ "At midday you will grope about like a blind man in the dark."

The reasons for groping "like a blind man in the dark" are as follows:"

Scientists do not yet fully understand why the body's natural immune response to HIV fails to kill the virus. Unlike many other viruses, HIV is a retrovirus that can rapidly integrate and disappear inside a cell and then replicate within the cell itself; HIV attacks the very cells that normally defend against infection and can also remain inactive in certain cells where it does not stimulate the immune system. The virus is also able to spread from cell to cell by syncytia formation without coming into contact with serum antibodies. The antigenic variability of HIV is also another problem, it changes its structure very fast and so there are many types or strains of HIV. The immune response triggered by the strains used in the vaccine may not be stimulated by other possibly newer strains. Furthermore, host immunologic response to HIV infection apparently varies greatly. Another unanswered question is why some antibodies neutralize some HIV strains while some were found to actually enhance replication of certain HIV strains. To date there is *no cure* for AIDS, and scientists are still searching for curative drugs (Vs 27).

Vs³⁵ "The Lord will afflict your knees and legs with painful boils that cannot be cured, spreading from the soles of your feet to the top of your head." The skin manifestations of AIDS are often disseminated, including the extremities particularly PPE (Fig 55).

Vs³⁷ AIDS patients are, regrettably, being stigmatized.

Vs³⁹ "Fearful plagues on you and your descendants" = Parents transmit AIDS to their babies; "severe and lingering illness" AIDS is a lifelong "lingering illness" and the opportunistic infections are classically, severe in AIDS patients, and "lingering."

Vs⁶⁰ AIDS is a "dreaded" illness, that has 'clung' to the human race, "...the diseases.....will cling to you" (Vs 60): HIV is a *lentivirus* that causes lifelong infection.

Vs⁶¹ "sickness not recorded" = AIDS is a new disease which has never been recorded before. Furthermore, diseases like oral hairy leukoplakia and bacillary angiomatosis came into being with the emergence of AIDS.

Vs⁶² AIDS has decimated the world's population as millions of people have died from it.

Verses 15 and 62 state that the disease is due to God's curse for disobedience of God's laws.

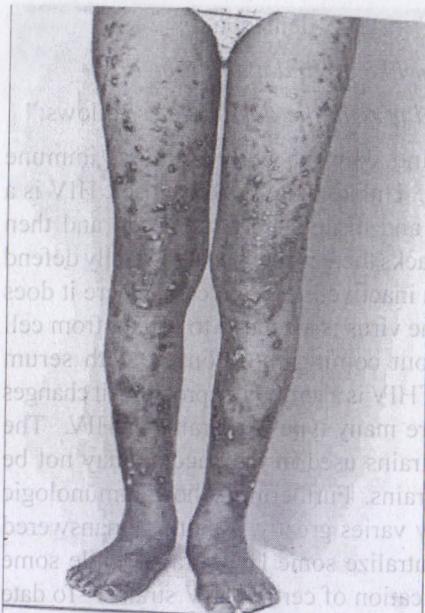


Fig. 55. Pruritic papular eruption
"itch.....knees and legs with painful boils"

¹⁵"However, if you do not obey the LORD your God and do not carefully follow all his commands and decrees I am giving you today, all these curses will come upon you and overtake you: ⁶²You who were as numerous as the stars in the sky will be left but few in number, because you did not obey the LORD your God."

(Deuteronomy 28:15 & 62)

Read **Romans 1:18-32** which describes God's wrath at sin.

Even the current "**human trafficking**" has been predicted in the Book of Revelation as signs of the End Time. Read **Rev. 18:11-13**. This list of various merchandise illustrates the extreme materialism of this society —

Babylon system. Few of these goods are necessities — most are

luxuries. The society has become so self-indulgent that people are willing to use evil means to gratify their desires. Even people had become commodities — the "*bodies and souls of men*" are sold to Babylon to gratify the flesh.

Babylon was the name of both an evil city and an immoral empire, a world center for idol worship. It has become a symbol for the center of world idolatry and wickedness. Their riches came from the misfortunes of others **Habakkuk 2:9-13**. Babylon symbolizes God's enemies of all times — an evil systems, anyone opposed to God.

Why has it taken God so long to punish people this way with AIDS?

"And the Lord passed by before him, and proclaimed, The LORD GOD, merciful and gracious, **longsuffering**, and abundant in goodness and truth, keeping mercy for thousands, forgiving iniquity and transgression and sin." (Exodus 34:6, 7)

"The Lord is slow to anger, and great in power, the Lord will not leave the guilty unpunished." (Nahum 1:3)

It is pertinent to note that sexual sin had always existed since the days of Old Testament (**Gn. 19:4, 5**). The destruction of Sodom is recorded in **Genesis 19:13, 24, 25** and Moses wrote **Genesis** between 1450 -1410 B.C. Moses also wrote **Leviticus** (where homosexuality is condemned)

and the date of events in **Letivicus** is 1445 -1444 B.C. Moses wrote **Deuteronomy** (where AIDS is described) and **Deuteronomy** was written about 1407/6 B.C. We are now 2004 years after the death of Christ. This means God had waited for about 3,500 years to implement the curse! Furthermore, we should not forget that the BIBLE was not available to guide the Old Testament people. So the present generation of people is a most privileged class. However, it is important to note that God judges all sins and punishes appropriately but not simply out of anger or vengeance. Rather, God's punishment is meant to correct us and to restore our fellowship with him (**Hebrew 12:5-11, Rev. 3:19**).

When HIV/AIDS emerged in the world of deadly diseases, scientists advocated the use of condoms as panacea. The same scientific researchers have now found out that HIV leaked in 10-25% of condoms tested. Experts argue that latex condoms have intrinsic holes called voids which make it possible for the virus to pass through. The smallest detectable hole on a condom is 1 micron. The HIV is $\frac{1}{10}^{\text{th}}$ - $\frac{1}{3}^{\text{rd}}$ size (0.1-0.3 micron) of that hole. Thus condoms have a substantial failure rate for HIV transmission.

"The LORD knows the thoughts of the wise, that they are futile." (1 Cor. 4:20)

"And there is no one who can deliver out of My hand;

I work, and who will reverse it?" (Is. 43:13)

Since the ravages of HIV/AIDS entered the medical scene, the world has committed trillions and trillions of dollars to contain the disease, yet it marches on. The cumulative amount of money committed worldwide to this pandemic possibly surpasses the budget of all African countries in the two decades of AIDS existence — in a continent already ravaged by hunger, famine, poverty, and diseases!

God Himself has said:

²Why do you spend money for what is not bread, And your wages for what does not satisfy? Listen carefully to Me, and eat what is good, And let your soul delight itself in abundance. ³Incline your ear, and come to Me. Hear, and your soul shall live."

(Is. 55:2, 3)

"Keep my commands and live" (Prv. 7:2)

"And His commandments are not burdensome." (1 Jn 5:3)

"The mouth of the LORD has spoken." (Is. 1:20)

"The counsel of the Lord stands forever. The plans of His heart to all generations."

(Ps. 33:11)

What next should be done?

God has answered thus:

"If my people who are called by My name will humble themselves, and pray and seek My face, and turn from their wicked ways, then I will hear from heaven, and will forgive their sin and heal their land." (2 Chr. 7:14).

In 2 Chronicle chapter 6, Solomon asked God to make provision for the people when they sinned. God answered with four conditions for forgiveness:

- (1) humble yourself by admitting your sins
- (2) pray to God, asking for forgiveness,
- (3) seek God continually, and
- (4) turn from sinful behaviour.

True repentance is more than talk — it is changed behaviour. Whether we sin individually, as a group, or as a nation, following these steps will lead to forgiveness. God will answer our earnest prayers.

A book of prophecy, commissioned by the Holy Spirit, on AIDS in the Holy Scriptures, the nature and character of God, Salvation, and the Second Coming of Christ, has been written and is already in the custody of the Church. This is a 3,500 page book in two volumes — by Mercy Olumide.

CONCLUSIONS

• What is dermatology and who is a dermatologist?

Dermatology is the study of the skin and its diseases, as well as the study of internal medicine and the many environmental factors that so frequently cause skin problems. A dermatologist is a physician who takes care of the physical, emotional and, as we have seen today, the spiritual needs of patients.

• Ultraviolet Radiation

Most people are unintentionally exposed to UVR. Exposure to natural UVR is unavoidable, whereas artificial UVR exposure occurs largely in the workplace. Exposure to UVB and to a lesser extent, UVA can cause adverse health effects, including premature ageing, increased incidence of skin cancers, cataracts, and immune suppression. Melanin is generally regarded as the major defense of the skin against the acute and chronic effects of sun exposure. Most of the serious adverse effects of UVR in Nigeria are seen in Albinos. No albino over the age of twenty was without premalignant or malignant skin lesions. The common sources of photocontact dermatitis in Nigeria are herbal concoctions and medicaments.

• Contact and Occupational skin diseases

Occupational skin diseases should not just be seen in isolation, they could indicate exposure to deadly toxic chemicals at work. Furthermore, seemingly innocent arthropod bites on outdoor workers such as oil field workers, foresters, surveyors, agriculturists, etc may foretell more serious bacterial, rickettsial, viral, or parasitic disease.

Several factors have been identified, that militate against effective humanization of the occupational life of workers. Some of these are materialistic employers and employees, ignorance about the hazardous effects of chemicals at work, poorly developed preventive medical and hygiene services, inappropriate factory building designs, and continued use of antiquated machinery which lack automation, hence exposing the workers to chemical splashes, inhalation of toxic fumes, and unacceptable noise levels.

Whilst it is desirable to put in place appropriate legislations to prevent exploitation of workers, there is a dearth of relevant personnel trained and skilled in accurately making the diagnoses of occupational diseases in the industries.

The existing Factory Act is grossly inadequate as regards protection against occupational skin diseases which are protean and quite often indicators of serious systemic toxicity. Hands afflicted by extensive dermatitis, for example, is a serious handicap. The hands are organs of expression, organs of communication and means of livelihood. As a well adjusted and profitable activity of man, work can be a factor in health promotion. It is the most significant indication of effective and productive existence of the human being.

Effective supervision of health related requirements is further hampered by fragmentation and duplication of functions among different agencies.

• Arsenic toxicity

Sporadic cases of cutaneous manifestations of chronic arsenic poisoning have been seen in our clinic. Chronic arsenic poisoning is a serious problem in developing countries due to the drinking of groundwater naturally contaminated with this element. In addition, carelessness in the dumping of pesticides, the leakage of waste products into water supply, and the inhalation of arsenic fumes from burning of plywood pre-treated with chromated copper arsenate represent another possible source of poisoning. The use of firewood to cook—apart from encouraging deforestation and its attendant ecological damage, also encourages the use of plywood—waste products

from e.g industries, and carpentry. Epidemiological studies have shown that those who live in villages located near old tin mines where workers dumped arsenic into the pond after extracting the tin and wolfram developed evidence of arsenic poisoning. Rodenticides and other pesticides are manufactured, packaged and sold in every nook and cranny in Nigeria, on the roads, in public transport, in the market place etc. Millions of Nigerians are not aware of the guidelines for safe use. Cancers of the liver, breast, bladder etc continue to take its toll on the lives of Nigerians. Infectious agents and genetic factors have often been assumed as causal or predisposing factors. Causal relationships to environmental chemical toxins have hardly been researched into because of the long latency period between exposure and clinical manifestations.

• **Epidemiology**

Vitamin A deficiency is still a notable problem among the paediatric age group seen at the skin clinic. The Top Ten groups of diseases seen at the skin clinic are papulosquamous eruptions, fungal infections, occupational and contact dermatitis, parasitic infestations, acne keloidalis nuchae, autoimmune diseases, bacterial infections, atopic eczema, pigmentary disorders, and HIV/AIDS associated diseases.

• **Training Health Care Providers**

Experience and data show that a large proportion of visits to health clinics in developing countries is for skin disease; and the most exploited patients by quacks are patients with skin diseases and sexually transmitted diseases. Many medical students graduate without ever receiving any significant education about skin diseases and many primary care physicians encounter cutaneous disease on a daily basis and will continue to do so. Nurses also often constitute the sole health care providers in primary health care centres, school clinics, and some industrial clinics and in-house clinics in the work place. Only very few dermatologists graduate annually from the post graduate medical colleges. The vast majority of patients seen in the clinics at tertiary health care facilities are patients with skin diseases which could have been effectively managed by the Primary and Secondary Health care providers. There is a dearth of Publishers for tertiary text books.

• **Dermato-venereology in the Holy Bible**

Although we live in a fallen world, God still cares for us, and He gave us standards to help prevent diseases and live healthy lives.

RECOMMENDATIONS

• **History**

Living in times of ethical crisis, we, the physicians, must redetermine our mission, which is to provide health and welfare to humanity. Hippocrates' teaching of respect and compassion to the patient should always guide our efforts. We should pay tribute to our ancestors and to our teachers and continue to work with devotion, enthusiasm, inspiration, and humanism to make a better world for the generations to come.

• **Protection against UVR**

A number of strategies are available to prevent the untoward effects of ultraviolet radiation. Ultraviolet radiation from artificial sources may be measured and monitored periodically so that employees are not exposed excessively. It may be necessary to shield ultraviolet light sources and to reduce the reflectivity of surfaces in the area. Several clear and coloured plastics effectively shield ultraviolet radiation, but care must be taken to ensure that their protective properties remain constant over a period of time, as some plastics lose their absorptive properties with use.

Dark clothing will usually attenuate ultraviolet radiation. The choice of sunscreens depends on the specific wavelengths to be screened out. Spectroradiometers are available that satisfactorily characterize ultraviolet exposures so that the potential hazard can be assessed. A thorough evaluation should include a consideration of the spectral (i.e. wavelength) composition, intensity, duration of exposure, contributions from reflections, and protection provided by clothing and shielding.

Albinos should be appropriately counseled not to take on any occupation that exposes them to additional doses of ultraviolet light, and parents and school teachers should be educated not to give albinos any assignment that exposes them unduly to ultraviolet light e.g. farming, and street trading. The setting up of an Albino Registry may be a worthwhile social service to aid albinos secure appropriate occupations.

As with the environmental threat of UVR alone, the major approach to protection against photosensitized damage is through obtaining knowledge of the threat and education of the threatened population.

• **Occupational Health**

There is the need for a single government agency to decisively monitor health problems in industry rather than fragmentation and duplication of

functions among different agencies. The occupational health units in the Ministries of Health and Labour can jointly build up an effective and functional National Institute for Occupational Safety and Health. Such is the complexity of the health problem in industry, that there is the need for a revision of the training programmes of personnel responsible for monitoring the health of workers in industry.

No doubt there is the need for well developed workmen's compensation statutes. Emphasis should also be placed on enlightenment of workers on health hazards in the working environment and how to prevent these hazards. Enlightenment programmes should be as relevant as possible with well defined objectives.

To the employers the following advice is appropriate:¹²⁷

- People must always be more important than products.
- Keep away from pride in your own programs, plans, and successes.
- Remember that God's will and Word must never be compromised.
- People must always be considered above the making of money.
- Do what is right, no matter what the cost.
- Be involved in businesses that provide worthwhile products or services — not just things that feed the world's desires.

• **Environmental arsenic and other chemical poisoning**

In this era of evidenced-based-medicine, well equipped toxicological centres should be available in every local government where samples of water from wells and boreholes can be analysed to ensure that they conform to WHO maximum recommendation or allowable level of arsenic in drinking water. Furthermore, the provision of safe drinking water is an important municipal service which every citizen is expected to enjoy. At least each state should have a good central laboratory where samples of hair or nail clippings and other biological specimens of patients can be sent for analysis in suspected cases of toxic chemical poisoning.

Alternative source of inexpensive energy for domestic cooking should be made available for housewives. Furthermore, indiscriminate burning of shavings from marine plywood near residential areas should be discouraged. These measures will help to eliminate inhalation of arsenic fumes.

There is need for *sustained* epidemiological research into the possible causal relationship between environmental toxic chemicals and various cancers in Nigeria; infectious agents should not be the only consideration.

The Environmental Protection Agency (EPA) should design strategies for improving awareness of dangers, and for monitoring exposure to arsenic

among other toxic chemicals. Public health care and disease control programs should be included to ensure that arsenic-free drinking water and food is supplied to populations, particularly those living in high-risk areas (e.g. communities in and around abandoned or old mines).

The print and electronic media should continue to feature sites of illegal mining in various parts of the country. Economic loss to the nation should not be the primary concern; health hazards both to the miners and inhabitants of the villages should be of even greater concern.

• **Epidemiology**

The current national policy to augment the Vitamin A intake of children should be sustained. The trend in the frequency of skin diseases should be considered when designing curricula for all cadres of health care providers, compiling the essential drug list; and formulating health policies for Nigeria.

Training health care providers

There is a need for intermediate manpower training to offer credible dermatological services at the lower levels of health care. Hence, a Diploma or Masters programme of just one academic year is being proposed for doctors.

The nursing curriculum in Nigeria should be revised to include a substantial component of occupational and industrial medicine.

Employers should ensure that they sponsor their doctors and nurses for continuing medical education (CME) courses already being run by Medilag Consult.

A sustained national book policy for tertiary education is desperately needed.

• **Dermato-venereology in the Holy Bible**

"If My people who are called by My name will humble themselves, and pray and seek My face, and turn from their wicked ways, then I will hear from heaven, and will forgive their sin and heal their land." (2 Chr. 7:14).

and finally, worship God in the beauty of intellectual wisdom!

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I remember, with fondest memories today, my late parents, George and Eunice OKEGE (aka — *Papa* and *Mama* Jos), and my late junior brother - Bankole. I know they shall all rise "*when the last trumpet shall sound*" because my Redeemer lives! My brothers and sisters — Mrs. Oluremi Igun, Mrs. Jumoke Adetola, Mrs. Yinka Adenugba, Mr. Biyi Okege, Mrs. Bisi Oleghe and Dr. Shile Okege have remained a constant source of encouragement and support to me (their "kid sister") since our childhood days. They are all present here tonight. May we all continue to enjoy the abiding presence of our Lord Jesus Christ - Amen.

Emeritus Prof. Olu Akinkugbe suggested, in the first instance, that I should specialize in Dermatology. This was sometime in 1971 when he visited Geneva, Switzerland on a WHO assignment. I was then with my family in Geneva when my husband was working with the diplomatic mission of Nigeria to the United Nations Office in Geneva. In retrospect, I now believe the Holy Spirit spoke to me through Prof. Akinkugbe, and I thank him for being the channel of communication.

Prof. Paul Laugier, of the Cantonal University Teaching Hospital in Geneva, Switzerland, taught me the first steps in dermatology. He nurtured my curiosity, and to his enthusiasm I owe my fascination with the dermatosciences. Professors C.D. Calnan, Meara, Wilson-Jones, Samaan, Cronin and all other academic members of staff of the Institute of Dermatology of the University of London, made me grow in the specialty, and unfolded for me the beauties of, and sustained my excitement for the dermatosciences. God bless them all.

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My Father in heaven has given me a heavenly designed family. My husband, Mr. Adekunle Olumide OON (a former Permanent Secretary in the Federal Civil Service and now Director General of the Lagos Chamber of Commerce and Industry) and my Children — Oyindamola (an architect), Kunle *Jnr*, (a mechanical engineer), Babatunde (a physician), and Oloyede (a computer information scientist) have continued to make themselves available for the peaceful joy which passes all human understanding, and which can only be experienced in living union with our Lord, Jesus Christ. Indeed, my first grandchild, bears the name — Oluwasemilore, which spells out God's abundant blessings on our family.

Doxology

"Now to Him who is able to do exceedingly abundantly above all that we ask or think, according to the power that works in us, ²¹to Him be glory in the church by Christ Jesus to all generations, forever and ever Amen.

(Eph. 3:20, 21).

Praise God from whom all blessings flow
Praise Him all creatures here below
Praise Him above ye heavenly hosts
Praise Father, Son and Holy Ghost — Amen.

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