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Community dermatology

1 A seminar on gardens for the health of the skin

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Abstract

This is a report on a seminar held on January 12, 2013 at the Regional Dermatology Training Centre in Tanzania, sponsored by the International Society of Dermatology as part of its Taskforce Program for *Skin Care for All: Community Dermatology*. There were four themes. (i) Gardens attached to health centers increase their attractiveness and result in increased attendance and, thus, increasa the utilization of effective skin care interventions. Literature on the positive effect on health and the environment of greenery surrounding health centers is reviewed. (ii) Adding an expert on agriculture to the staff of health centers in Rwanda has provided nutrition and safe medicines. (iii) In southern India these interventions are channeled through the empowerment of tribal women in an area noted for anxiety due to unemployment in the tea and forestry industry. The gardens are used for teaching about nutrition and herbal medicines and the women are further attracted by child minding facilities. (iv) Measuring barrier function defects gives early warning of malnutrition of the skin after damage by trauma or by ultraviolet radiation. Higher cost research techniques may help to provide the science required to provide its evidence base. In
8 conclusion, *Gardens for health* should be adopted as policy by skin carers.

Introduction

In 2010, the United Nations described the state of the worlds indigenous people.[1] It described poverty, conflict, dislocation, and powerlessness. The need for empowerment was emphasized. Empowerment of the poor and the importance of educating them on land management was the theme of a workshop in Tanzania, held in January 2012 at the Regional Dermatology Training Centre, Moshi, during the annual return of graduates for a 3-d conference of continuing medical education. It was sponsored by the International Dermatology Societys Taskforce for *Skin Care for All*: *Community Dermatology* (www.skincareforall.org).

The seminar embraced the theme expressed in an editorial in the *British Medical Journal*[2] explaining how the support of local culture should extend to land development, natural resources, and the desire to conserve and practice traditional knowledge. This should also embrace nutrition. Although there is an abundant amount of information concerning Food for Health in the files of organizations such as the Food and Agriculture Organization, it is not yet part of the language of the healthcare provider in the everyday management of patients and still less part of the curriculum of dermatology.

It was emphasized that effective skin function requires adequate nourishment. A compromised food supply is highly prevalent in areas of strife and climate change. Malnutrition is also prevalent due to ignorance and the eating of foods that are either insufficient to maintain health and sufficient weight, or that contribute to obesity and, thus, responsible for some of the greatest epidemics. These are occurring in both developing and developed nations. There is a link with poverty in part due to the unfavorable management of land. For individuals in need of food, land management is critical.

Several of the 213 graduates of the Regional Dermatology Training Centre to date have written on nutritional needs of their home communities in a Health Systems Research dissertation, a training requirement at the end of their first year of 2 years of tuition. Adequate nutrition is needed especially for the wasting condition AIDs, which they see so much of. However, it was also observed that common diseases due to bacterial infection, superficial cutaneous mycoses, and scabies are often worse in the malnourished.

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The most researched topic in recent times in the developed world is the contribution of malnourishment to delayed wound healing and concern for the repair of damaged skin.[3] The poor quality of food provided through health services is insufficiently recognized.[4] Lack of vitamin C, and protein and iron deficiency are common causes of failure to heal and the deficiencies do not have to be so severe as to cause recognizable skin disease. Oral ingestion of vitamins A and C, zinc, arginine, glutamine, glucosamine, bromelain (derived from pineapples), *Aloe vera*, and *Centella asiatica* all have beneficial single-variable effects on wound healing.[5]

When the functions of the skin fail due to malnutrition, a key remedy is empowerment of women and children to support each other and their men folk to improve the environment and the food it produces for the family. The intervention discussed was *Gardens for Health*. The term *gardens* is less threatening and more inviting than *land management*.

Greening the health care environment

As a preface to the request for gardens of health for nutrition, it was pointed out that the concept is not new to public health and community medicine in both the developed and developing world as a tool to improve the utilization of health services. Trees and woods can enhance social cohesion between health service estates and local communities through joint involvement in planting, maintenance, and enjoyment of trees and woodland. The United Kingdom National Health Service (NHS) has a web site (see www.nhsforest.oxtreegen.com), covering NHS needs and growing forests for health. There are even data suggesting that looking out on trees from a hospital bed can promote healing (see also NHS Forest Guidance Pack, www.nhsforest.org).

This NHS Forest campaign is a project set up by the Centre for Sustainable Healthcare to: (i) improve health of staff, patients and communities through increasing access to green space on or near to NHS land; (ii) to plant one tree per employee, amounting to a total of 1.3 m trees; (iii) encourage greater social cohesion between NHS sites and the local community; and (iv) bring together a range of professionals and volunteers to produce woodlands that includes the use of art, food crops, wood fuel and biodiversity. The objective of the NHS Forest program is to plant 1.3 million trees over 5 years, to establish a mature forest for the NHS centenary in 2048 and to realize proven benefits.

Research has shown that patient recovery rates from surgery improve when they can view greenery from their hospital window.[6]

Cooper and Barnes[7] reported that hospital gardens can 9
facilitate stress reduction, help a patient summon up their own inner healing resources, help a patient come to terms with an incurable medical condition, provide a setting where staff can conduct physical therapy and horticultural therapy with patients, provide staff with a needed retreat from the stress of work, and provide a relaxed setting for patient/visitor interaction away from the hospital interior.

A University of Glasgow study[8] found that, for England as a whole, people living closer to green space had lower death rates and less heart disease. Among lower income groups, 1300 extra deaths occurred each year in areas where the provision of green space was poor.

Trees and woods can have a restorative and therapeutic effect on the mind and especially in the management of children where an environment for play is so essential.[9]

Trees have been found to enhance mood, improve self-esteem, and lower blood pressure. Research in the Netherlands and Japan indicated that people were more likely to walk or cycle to work if the streets were lined with trees and that they tend to live longer and feel better as a result.[10]

Two reports outlined the benefits to physical and mental health arising from contact with the natural environment.[11,12] These included reductions in obesity, heart disease, diabetes, cancer, stress, attention deficit hyperactivity disorder, aggression, and criminal activity, among others. Researchers from the Universities of Bristol and East Anglia[13,14] found that people living closer to green spaces were more physically active, and were less likely to be overweight or obese, and people who lived furthest from public parks were 27% more likely to be overweight or obese. Greater opportunities for exercise provided by close proximity to a park reduced weight gain in teenagers by 5 kg over a 2-year period.

Numerous studies on green space, and particularly on woodland, have shown that they are highly valued by communities. Access to woodland is not only important for health benefits through exercise but also makes visitors feel happy, relaxed, and close to nature.[15]

Environmental volunteering, including tree planting, can be as effective as aerobics in improving fitness. Independent evaluation of BTCVs Green Gym concluded[16] that the overall physical health status of volunteers significantly improved, with 99% of participants reporting enhanced health and confidence. Trees and woodland have a measureable impact on air quality surrounding health premises, in particular by adsorbing pollutants such as sulfur dioxide and ozone, intercepting harmful particulates from smoke, pollen and dust and releasing oxygen through photosynthesis, thus reducing the incidence of diseases exacerbated by airborne pollutants. The negative effects of air pollutants are proportionately

greater in urban areas, where trees are close to sources of pollution and nearer to people who might be affected – yet tree cover in urban areas is often under threat.[17]

Trees can reduce urban noise through sound deflection and absorption and this can in turn improve the environment for patients and staff.[18] High noise levels have been found to increase perceived stress levels in staff and bring about anxiety and sleeplessness in patients.

Trees and woods can reduce the impact of the urban heat island effect, which occurs when hard surfaces in summer act as giant storage heaters, absorbing heat during the day and releasing it at night. Dramatic summer temperature differences of as much as 10 °C between London and its surrounding areas have been recorded, which in turn exacerbate the symptoms of chronic respiratory conditions. Projections suggest this problem will get markedly worse. The cooling benefits of trees can also help in heat waves, which are also projected to become more frequent. A study by the University of Manchester has shown that increasing tree cover in urban areas by 10% can reduce urban surface temperatures by as much as 4 °C. Handley and Carter[19] tackled the role of trees in reducing carbon footprint and flooding. Trees can, therefore, help mitigate climate change and reduce the NHS carbon footprint by absorbing carbon dioxide from the atmosphere and reducing the amount of energy used in heating and cooling a building. It is estimated that the NHS Forest project could directly absorb up to 260 000 tons of CO_2. Research in the USA suggests a per-tree saving in carbon emissions of about 10–11 kg/year.[20]

Attracting attendance at health centers

Experience from working in several countries had exposed the speakers to many very unattractive hospitals and health centers and rather few are beautified by well-kept gardens.

When writing about managing leprosy and encouraging attendance at health centers in India (http://www.leprosyhistory.org/), it became evident to Terence Ryan that there was a sharp contrast in attendance at those buildings surrounded by waste in dark and unventilated rooms with unpainted walls with unsmiling attendants compared to a health center surrounded by a garden, cooled by surrounding trees but with sufficient lighting and light colored walls to see the skin, with waste correctly disposed of and smiling employees tilling the surrounding garden. Such desirable features apply to health premises in all parts of the world.

The International Foundation of Dermatologys program in Mali revealed that health center medical and nursing staff were unable to identify scabies from impetigo or superficial cutaneous fungal infections. However, having remedied this by teaching programs that greatly reduced the cost of ineffective prescribing, there was still no perceptible impact on the prevalence of these diseases, for the simple reason that patients did not attend health centers. The question that must be asked is, What makes health centers attractive?. Correct diagnosis and low-cost prescriptions are two factors, followed by cultural competence of health providers when compared to traditional health practice.[21] Another factor was providing child minding with supervised crèche facilities used by tribal women. Finally, as discussed above is greening the environment.

Many of the problems that the *Skin Care for All*: Community Dermatology Task Force is trying to address, such as the consequence of climate change, poverty, and the needs of the aged or of infancy, can be tackled very effectively by simply greening the environment.

Consequences of subnutrition: benefits to the skin of ingestion of greenery

The question asked by the speakers were whether lack of food causes impairment of skin function and short of skin diseases could it explain in whole or part increased susceptibility, impaired immunity, delayed wound healing, and prolonged illness. The topic was covered more than three to four decades ago by David Werner and his colleagues in his book *Where There is no Doctor* and in Food first in the book *Helping Health Workers Learn*. It is a question asked in animal husbandry when a dying animal is host to heavy infestation. If so, this state of subnutrition may be more easily treated, resulting in an immediate recovery, by eating products from an easily accessible garden. Such a garden may be first in line as an intervention, while medicaments are added for more severe ill health.

For every child who is seriously malnourished, there are many others less so, small and thin but not ill to look at, yet with a low resistance to infection. They succumb to more diarrhea, more upper respiratory tract infections, which last longer and progress to more complications. Impetigo, superficial cutaneous fungal infections and severe scabies are the commonest skin problems, which, as in malnourished or terminally-ill animals, can be overwhelming. Carter *et al.*[22] showed that increased consumption of green leafy vegetables is associated with a reduction in the risk of developing type 2 diabetes and, hence in a reduction of its associated skin complications.

Improved barrier function was demonstrated by studying decreased transepidermal water loss relative to placebo following ingestion of borage, green tea and vitamin E.[23] A double-blind randomized placebo-controlled trial of oral green tea polyphenols caused a reduction in the appearance of photodamaged and aged skin.[24] In a study

of 4025 women aged 42–74 years, the degree of wrinkling, dryness, and atrophy of the skin was clearly related to lower levels of dietary lipids and vitamins.[25]

It is of particular interest that many studies contradict earlier evidence of no-effect when agents were studied 14 single-variably. Synergism of plant components is very 15 important. Shi and Le Maguer[26] demonstrated how vitamins could work together. Monique Simmonds (Director of the Kew Gardens Innovation Unit, Deputy Keeper and Head of Sustainable Uses of Plants Group) is quoted (personal communication) as saying that had they listened to the Shamans of the developing world, this would have been obvious much earlier. A well-attested example of how whole plants are better than single agents can be found in *Cinchona* bark. The malarial parasite failed to develop resistance to *Cinchona* or quinine but was quick to develop resistance to the single chemical species chloroquine. There are similar studies on plant-derived gamma linolenic acid, particularly effective in augmenting skin barrier function.[27]

The precise mode of processing and cooking is often critical, as demonstrated by the photoprotective effects of tomato, which are most beneficial when cooked and mixed with oil.[28]

Experience of *gardens for health* in Rwanda and in the Nilgiris, southern INDIA

Teachers spoke of their experience from two centers, Bradley Snyder from Rwanda and Vanya Orr from south India specializing in education of the poor and malnourished. Rwanda is a country with a large population greatly stressed by genocide. The Mission Statement presented to *Gardens for Health International* (Rwanda; www.gardensforhealth.org) was Gardens for Health provides agricultural solutions to health problems. It is a partnership with health clinics to equip families facing malnutrition with resources and know-how for greater self-sufficiency. Snyder compared the government handouts of packaged food in Rwanda and rice bowls of India as poor in quantity and quality compared to growing garden produce.

The bulk of international food aid shipments, including those sent to countries with a high burden of malnutrition (such as parts of sub-Saharan Africa), are comprised of corn–soy blend (CSB) fortified flours, which do not include the vital nutrients and proteins that growing children require. The United States alone annually ships approximately 130 000 metric tons of substandard corn–soy blend (grown and processed on American farms) to the developing world.

In Rwanda, a demonstration garden is planted in the immediate vicinity of the health center. The aim is to:

1 Identify: find and correctly diagnose children who are severely or moderately malnourished;
2 Treat: ensure malnourished children get any emergency treatment they may need to survive;
3 Grow: help families establish homestead food production, and
4 Teach: provide holistic education that covers a diversity of causes and solutions to malnutrition.

The health center has added to its staff a nutritionist who treats, an agriculture worker who grows, and educationalists who teach.

There is a home garden package consisting of vegetables, fruits, staple crops, and small life stocks that restore health and can generate additional income. There are home visits and cooking demonstrations. They incorporate natural/traditional medicine into home gardens and demonstration gardens. All who are in need receive a prescription for nutrition in the form of tips for practice. Complex issues are made simple and practical. Thus choice of daily food is color coded (Fig. 1).

Sample trees

As an example of a plant of great nutritional value from the tropics, the Moringa tree (Fig. 2) was discussed by Bradley Snyder. It illustrates the tremendous value a tree 16 may have in the restoration of health. It is present throughout the tropics and undemanding when grown in bulk.[29]

Making a spray from its leaves accelerates growth of young plants, which are, as a result, firmer, more resistant to pests and disease, and have a longer lifespan, with heavier roots, stems, and leaves. It produces larger and more fruit than other species with a relative increase in yield of 20–35%. Its tiny leaves are extremely nutritious, providing seven times more vitamin C than oranges, four times more vitamin A than carrots, three times the calcium of milk, three times the potassium content of bananas, and twice the protein of yogurt on a relative basis. 17

Another example of a tree with multiple uses can be found in the Neem tree, often planted outside buildings where it provides shade and acts as a deterrent to mosquitos.

The intervention is education

Speaking next was Vanya Orr from Ooti in the Nilgiris, southern India (http://www.earthtrustnilgiris.org), where she has been a pioneer of greening the environment and improving the quality of the earth. The Indian Systems of Medicine experience of Ayurveda and Siddha indicate that herb gardens not only provide nutrition but improvement in the appearance of the health center environment and that this attracts custom. The Indian Systems of

COLOR

Figure 1 A simple color guide to healthy eating created by Bradley Snyder

COLOR

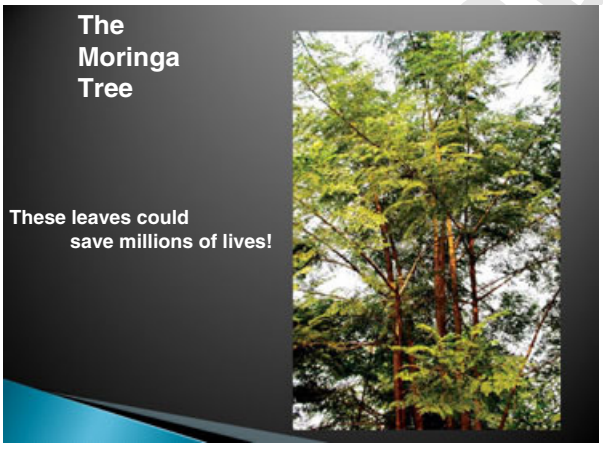

Figure 2 The Moringa Tree, which throughout the tropics is a rich source of nutrients

Medicine regard nutrition as an essential intervention for a healthy constitution. So Vanya Orrs work is directed at restoring ancient customs to tribal people who have lost their way. She describes tribal peoples whose lives have been upset by the changes in their environment by forestry and tea planting with much recent unemployment. Vanya Orr is concerned with the breakdown of structures and the violence and alienation found in villages that have lost nurturing skills. She aims to teach people how to survive partly by restoring ancient customs. It is about the use of traditional knowledge to help strengthen tribal communities and to restore the environment stricken by international corporations. She claims that contemporary education of children ignores their place in the environment and she is trying to change this.

In Fig. 3 they are competing to show who has prepared the best compost. So great is their enthusiasm, these children *infect* visiting farmers with the will to restore the earth in the southern Indian hills and plateaus and Vanya Orr has been invited to teach farmers and school children as far afield as Bhutan.

Like the Rwanda project, this is a program linked to primary health care. Nutritious herbs are recognized,

COLOR

Figure 3 One of the most powerful tools for change is the enthusiasm of children. Here they demonstrate the soil they have worked on

COLOR

Figure 4 Women preparing herbal medicines from their 18 Gardens for Skin Health

grown, and eaten (Fig. 4). While they generate income for tribal women, this is not a main aim. However, security and happiness is! In a damaged ecosystem, restoration of soil, so that it is fertile and promoting organic and biodynamic farming as a demonstration model to the nation, is bringing together farmers and bringing young people closer to their origins and traditions.

Nearly 50 villages have been encouraged to develop *Gardens for Health* but more than 200 hundred villages are touched by the restored knowledge and experience sharing. Health teaching is linked to Indian Systems of Medicine, Siddha and Ayurveda, but is made relevant to the health of modern disease such as HIV/AIDS.

The detection of skin failure

Skin failure manifests as: (i) loss of barrier function between the body and a threatening environment; (ii) the

COLOR

Figure 5 Photosensitivity due to niacin deficiency (pellagra). Courtesy of Rosemary Moser

inability to manage overheating or excessive cooling; (iii) sensory impairment, causing itch, pain, or numbness; and (iv) disfigurement and consequent faulty communication of the look-good, feel-good factor. These have not commonly been measured as markers of malnutrition. Malnutrition has long been recorded worldwide as stunting, underweight, reduced arm circumference and by a few well-recognized diseases of the skin, such as pellagra (Fig. 5.)

The biomedical background to this study

Ryans presentation was with the help of equipment loaned by Paul Matts using pellagra, a vitamin B/niacin deficiency, as an example of impaired barrier repair associated with photosensitivity consequent on subnutrition. Fuchs and Kern showed that D-alphatocopherol and L-ascorbic acid were modulators of ultraviolet-induced inflammation.[30] Sensitivity to solar ultraviolet radiation can be detected by determining an individuals minimal erythema dose, a relatively simple test to perform familiar to most dermatologists, flagging potential susceptibility before the full development of disease. This vitamin B deficiency affects the superficial skin cells, which constitute the barrier, as well as impairing the immune function of the skin. Although less easily studied in the developing world the abovementioned themes need evidence supplied by studies in the developed world and could take advantage of some of the technologies, now used to detect subnutrition short of disease, which are hand-held monitors of skin function for measuring barrier function.[31–33] 19

The tests described included: (i) modern, wireless hand-held evaporimeters for the measurement of transepidermal water loss; (ii) modern, wireless hand-held probes for the measurement of skin surface hydration via capacitance, conductance, or impedance; (iii) tape-stripping of skin surface exfoliating cells and subsequent analysis of morphology by light microscopy and assessment of maturity by a variety of immunochemical probes; and (iv) determination of ultraviolet radiation sensitivity/minimal erythema dose. All of these techniques can be utilized to examine readily the effectiveness of nutritional interventions.

Conclusion

The Annual Continuing Medical Education Courses held for previous graduates of the Regional Dermatology Training Centre in Tanzania aim to teach the kind of skin care that is relevant to rural areas in some 12 African nations. The graduates hear about latest advances in, for example, genetics or pharmaceuticals, but they are always encouraged to understand the approaches described in the United Nations State of the Worlds Indigenous Peoples. Gardens for Health meets the expectations of the United Nations to move away from the kind of teaching, which they so regret as dominated by Western Philosophy.

The importance of an attractive heath center and the value of it having a demonstration garden will add to their knowledge, and the addition of a child minding facility will attract and empower tribal women.

Lack of food is one cause of malnutrition, but conversely obesity has now become the greater epidemic. This seminar was about empowerment of women by health centers made attractive by gardens and child minding. They can pick up advice on growing vegetables and their nutritional and medicinal value.

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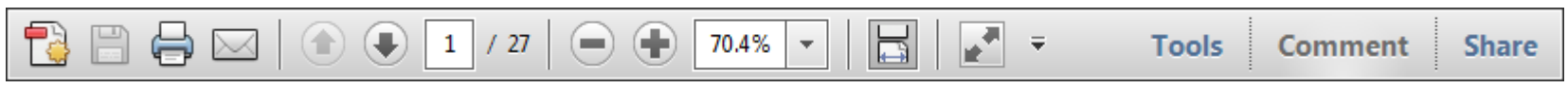
22	AUTHOR: Please check the page range for reference [2].	
23	AUTHOR: Please provide the publisher location for reference [27].	

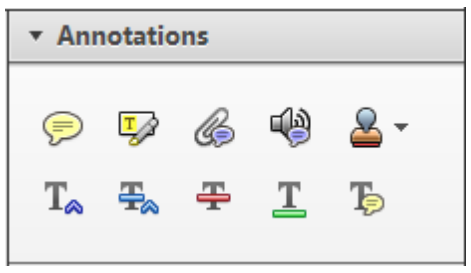
USING e-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

Required software to e-Annotate PDFs: Adobe Acrobat Professional or Adobe Reader (version 8.0 or above). (Note that this document uses screenshots from Adobe Reader X)
The latest version of Acrobat Reader can be downloaded for free at: http://get.adobe.com/reader/

Once you have Acrobat Reader open on your computer, click on the Comment tab at the right of the toolbar:



This will open up a panel down the right side of the document. The majority of tools you will use for annotating your proof will be in the Annotations section, pictured opposite. We've picked out some of these tools below:

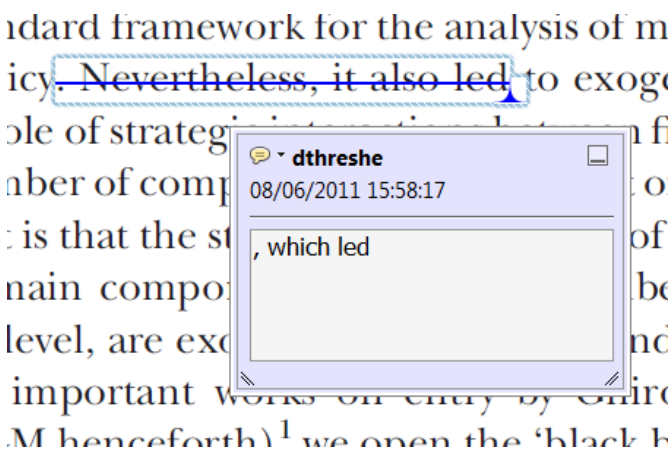


1. Replace (Ins) Tool – for replacing text.

Strikes a line through text and opens up a text box where replacement text can be entered.

How to use it

- Highlight a word or sentence.
- Click on the Replace (Ins) icon in the Annotations section.
- Type the replacement text into the blue box that appears.

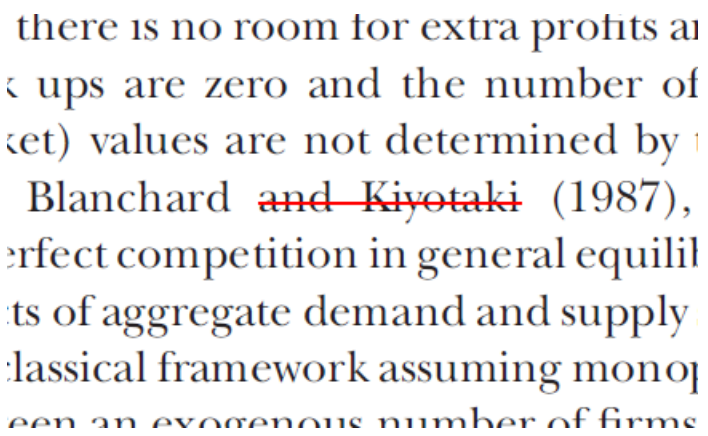


2. Strikethrough (Del) Tool – for deleting text.

Strikes a red line through text that is to be deleted.

How to use it

- Highlight a word or sentence.
- Click on the Strikethrough (Del) icon in the Annotations section.

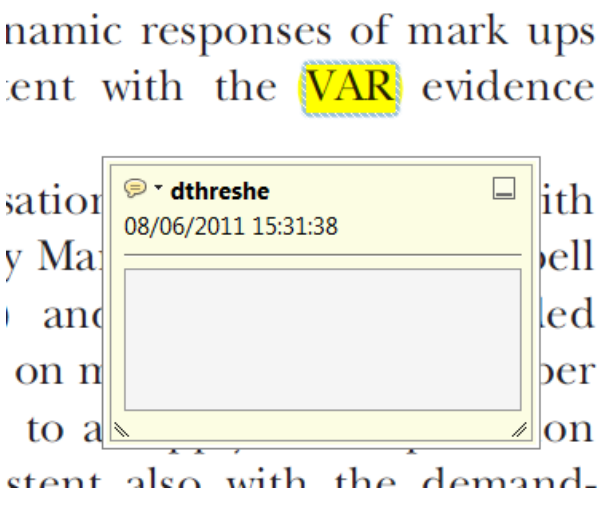


3. Add note to text Tool – for highlighting a section to be changed to bold or italic.

Highlights text in yellow and opens up a text box where comments can be entered.

How to use it

- Highlight the relevant section of text.
- Click on the Add note to text icon in the Annotations section.
- Type instruction on what should be changed regarding the text into the yellow box that appears.

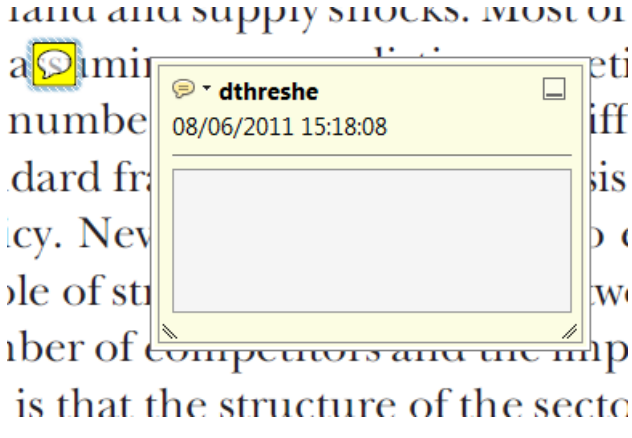


4. Add sticky note Tool – for making notes at specific points in the text.

Marks a point in the proof where a comment needs to be highlighted.

How to use it

- Click on the Add sticky note icon in the Annotations section.
- Click at the point in the proof where the comment should be inserted.
- Type the comment into the yellow box that appears.



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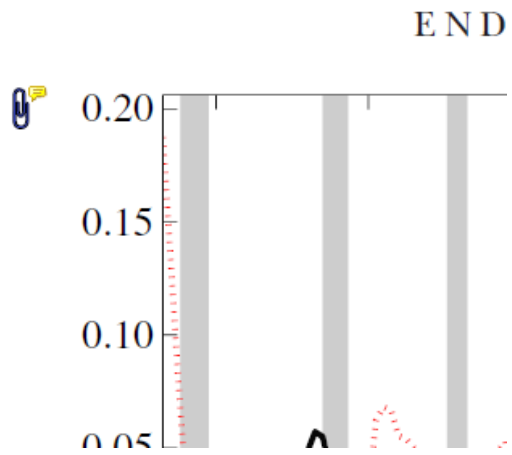
USING e-ANNOTATION TOOLS FOR ELECTRONIC PROOF CORRECTION

5. Attach File Tool – for inserting large amounts of text or replacement figures.

Inserts an icon linking to the attached file in the appropriate pace in the text.

How to use it

- Click on the Attach File icon in the Annotations section.
- Click on the proof to where you'd like the attached file to be linked.
- Select the file to be attached from your computer or network.
- Select the colour and type of icon that will appear in the proof. Click OK.

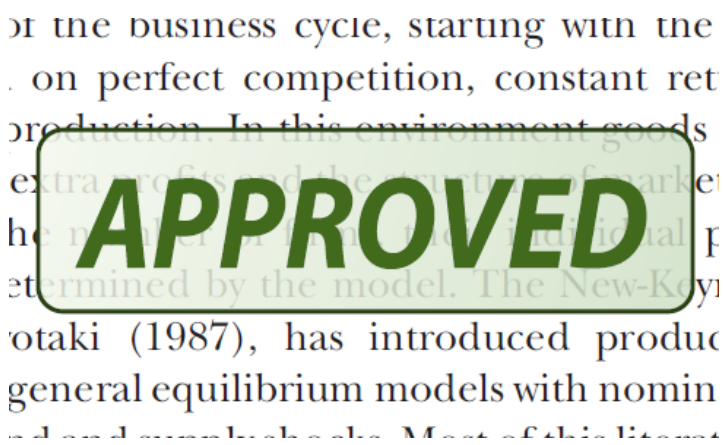


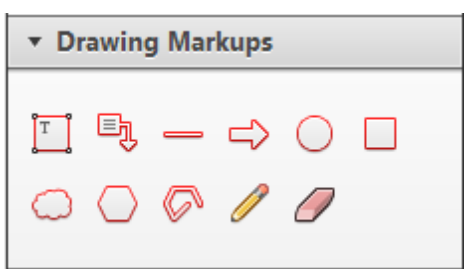
6. Add stamp Tool – for approving a proof if no corrections are required.

Inserts a selected stamp onto an appropriate place in the proof.

How to use it

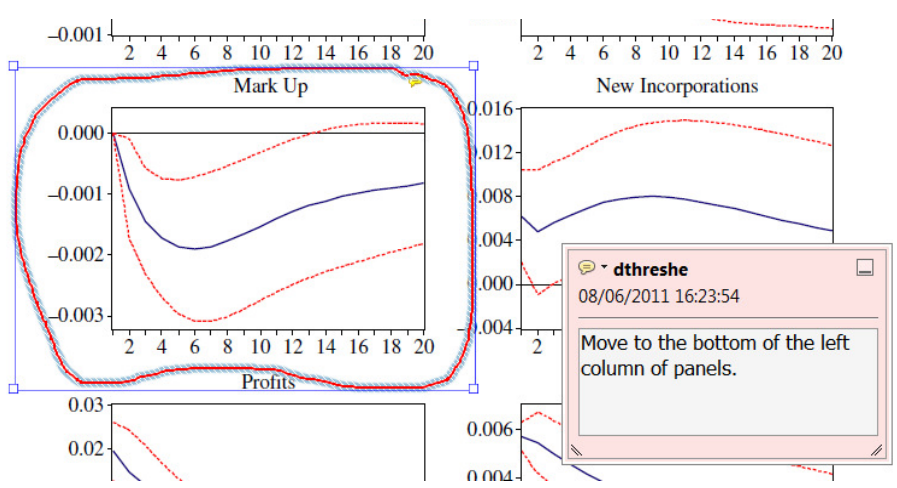
- Click on the Add stamp icon in the Annotations section.
- Select the stamp you want to use. (The Approved stamp is usually available directly in the menu that appears).
- Click on the proof where you'd like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).





7. Drawing Markups Tools – for drawing shapes, lines and freeform annotations on proofs and commenting on these marks.

Allows shapes, lines and freeform annotations to be drawn on proofs and for comment to be made on these marks..



How to use it

- Click on one of the shapes in the Drawing Markups section.
- Click on the proof at the relevant point and draw the selected shape with the cursor.
- To add a comment to the drawn shape, move the cursor over the shape until an arrowhead appears.
- Double click on the shape and type any text in the red box that appears.

For further information on how to annotate proofs, click on the Help menu to reveal a list of further options: