

Plant Cell Biology on DVD

Information for Students
& a Resource for Teachers

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Instruction Manual
and Guided Tour

- Installation and Requirements
- Navigation in Chapters & Topics
- Labels, Text and other Facilities
- Preparation of Slide Shows

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Installation of “Plant Cell Biology on DVD”

“Plant Cell Biology on DVD” is provided on a DVD. Place the DVD in the computer’s DVD drive, wait for the autorun facility to open the setup screen (if autorun has been turned off, navigate to the DVD drive in Explorer and run the “setup.exe” program found there).

The setup screen offers two options: (1) “Run from DVD” – this allows access to the contents without need of installation, but response times are slower than if Option 2 is selected; (2) Instal – this copies everything to the computer’s hard drive by running an installer; it requests acceptance of a Licence Agreement and input on where to store the program (defaults are offered, ~3.5Gb drive space required). Follow the on-screen instructions. Shortcuts to the main program, a pdf file of this Manual with its “Guided Tour” and an uninstaller are placed in the Windows Start Menu, and an icon on the desktop. Start the program using the desktop icon or “Plant Cell Biology on DVD” in the Start Menu.

System Requirements

“Plant Cell Biology on DVD” requires a PC with Windows® 95 (or preferably a more recent) operating system, a DVD drive and a display setting of 32K colour or 64K full colour. Adobe Acrobat Reader® is needed to open the pdf files (available free from www.adobe.com), and Apple Quicktime Player® is needed to run the movies (available free from www.apple.com). Recent model Mac computers may work if they are equipped with dual operating systems. The Quicktime controller bar is present but not visible in Windows 64-bit systems

Where to find Help

This Manual describes the various navigational and other control elements in the “Plant Cell Biology on DVD” user interface. Additional Help information may be found in:-

1. The first item in the Main Chapter Menu, which opens a set of screens describing all of the features of the interface;
2. “Pop-up” boxes describing the functions of the screen-frame buttons: by default these are “off”, but may be activated by clicking the “show help tips” button at lower right on the screen frame;
3. A “Guided Tour”, which is installed as part of the Instruction Manual in the Windows Start Menu, along with the Plant Cell Biology on DVD program. This document gives step-by-step examples demonstrating the features of the interface.

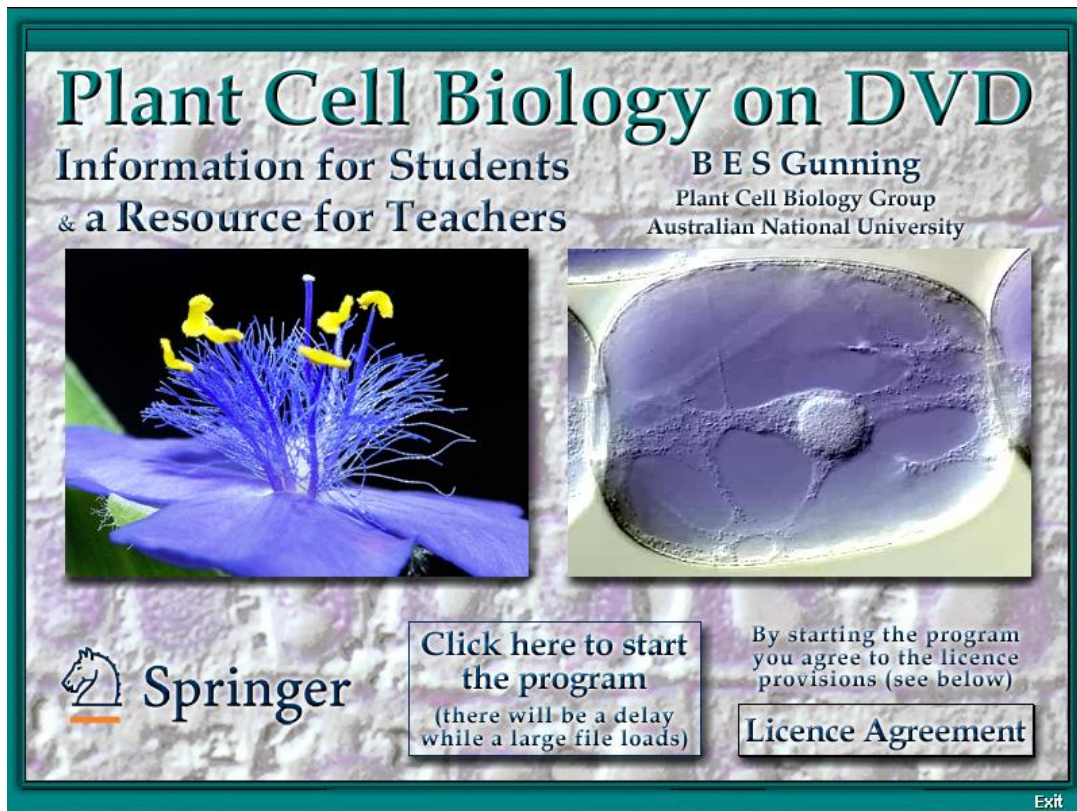
Individual use, Lecture Room use and Classroom use

The program can be used by individuals at a PC, however, other modes are possible.

The image quality is suitable for connecting the PC to a video projector in tutorial or lecture room situations. The projection screen is filled if the PCs display settings are adjusted to 800x600 pixels, but with some projectors it may also be possible to obtain an adequate image size by using a zoom control combined with a larger PC screen resolution.

For those with a “Multi-User Licence”, “Plant Cell Biology on DVD” can either be loaded on to all computers in the classroom, or run from a central server. In either case it can be used by providing members of the class with “Program Files” (see pages 9, 12) that have been prepared beforehand by the teacher, and which contain pre-selected sets of images.

The Opening Screen:



Clicking either of the buttons is taken as to indicate that the user accepts the Licence (which can be viewed by clicking the button at lower right). Proceed to the opening menu by clicking the button at lower centre (or from the Licence screen)

The Opening Menu of Chapters:

The opening menu contains a list of CHAPTERS. Sub-Menus appear when the mouse is passed over the list of Chapter headings (see next).



The Chapter Menu and its Sub-Menus:

Chapter Menu		show menu of topics in chapter 10	show a menu of the screens in this Topic	retrace screens	show index
1	Help screens				
2	Introduction to plant cells				
3	Nucleus				
4	Endoplasmic reticulum				
5	Golgi apparatus				
6	Plasma membrane				
7	Plasmodesmata				
8	Vacuole				
9	Mitochondria				
10	Plastids				
11	Peroxisomes				
12	Cytoskeleton				
13	Vesicle trafficking				
14	Organelle interactions				
15	Miscellaneous				

Chloroplasts			
Basic Features			
Proplastids			
Chloroplasts			
Etioplasts			
Amyloplasts			
Chromoplasts			
Elaioplasts			
Leucoplasts			
Origins & division			

The chloroplast stroma compartment		
DNA nucleoids		4
Ribosomes		2
Rubisco		7
Carboxysomes		
Pyrenoids		31
Starch grains		6
Plastoglobuli		
Phytoferritin		6
Glycosidase		
Eyespots		4

10.3.6.3 Ribulose 1,5-bisphosphate carboxylase / oxygenase

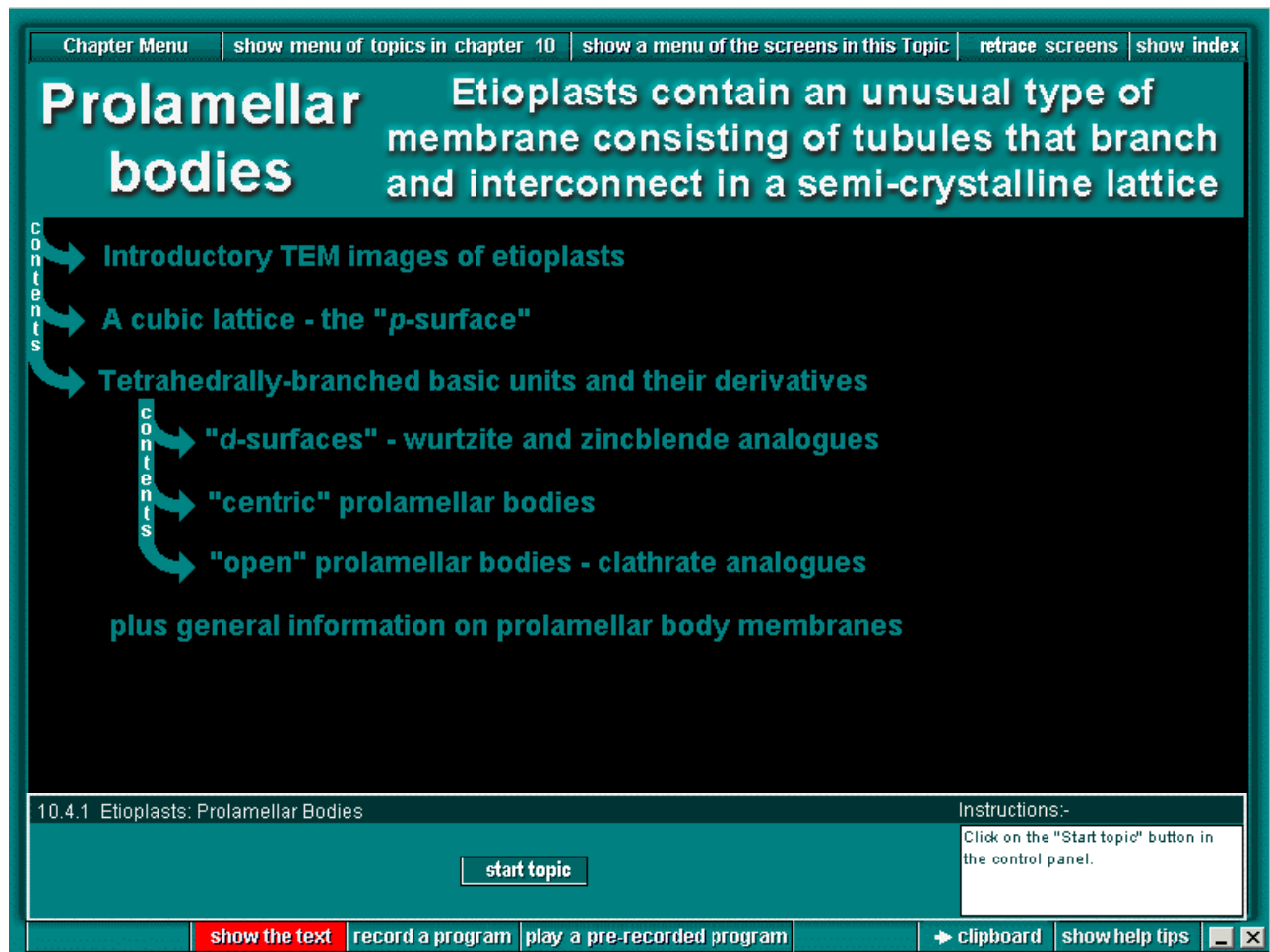
Instructions:-
Click on the "Start topic" button in the control panel.

start topic

show the text record a program play a pre-recorded program → clipboard show help tips

- This illustration shows the Chapter menu (left) with three successive levels of sub-menus open, starting with Chapter 10 "Plastids" (cyan highlight), then "Chloroplasts", then "The chloroplast stroma compartment" and finally a list of Topics, with "Rubisco" highlighted for selection.
- The presence of an arrowhead on a menu item indicates that a further sub-menu can be opened.
- Items are highlighted as the mouse is passed over them. Eventually TOPICS are reached - they have a different highlight, no arrowhead, and a number indicating how many SCREENS there are within the TOPIC.
- The menu system closes if the mouse is clicked anywhere on the screen away from the menu items themselves.
- Select a TOPIC by clicking on it.

The Title screen of a TOPIC:



- When a TOPIC is clicked in the Main Menu, you are taken directly to the TITLE SCREEN of the TOPIC, as in the example above. This SCREEN introduces the contents of the Topic.
- There is a Control Panel across the bottom of the screen, showing the name of the Topic. All Title screens have the same type of Control Panel, with just one button "Start Topic" and the Instruction "Click on the "Start Topic" button in the Control Panel".
- Most TOPICS have multiple SCREENS. The "Start Topic" button takes you to the first one. Each SCREEN has its own set of navigation buttons and Instructions in its own Control Panel.
- To open a TOPIC from a Title screen, simply click on the "Start Topic" button to go to the first SCREEN.
- See later for other functions on the upper and lower toolbars and in the Control Panel of Topic Screens.

Descriptions of the upper and lower tool bars on the screens:

These bars carry buttons for:- (a) navigation, (b) checking the user's progress through the contents, (c) controlling the appearance of the screen, and (d) recording and playing sequences of screens, as described below:-

Chapter Menu



Chapter Menu

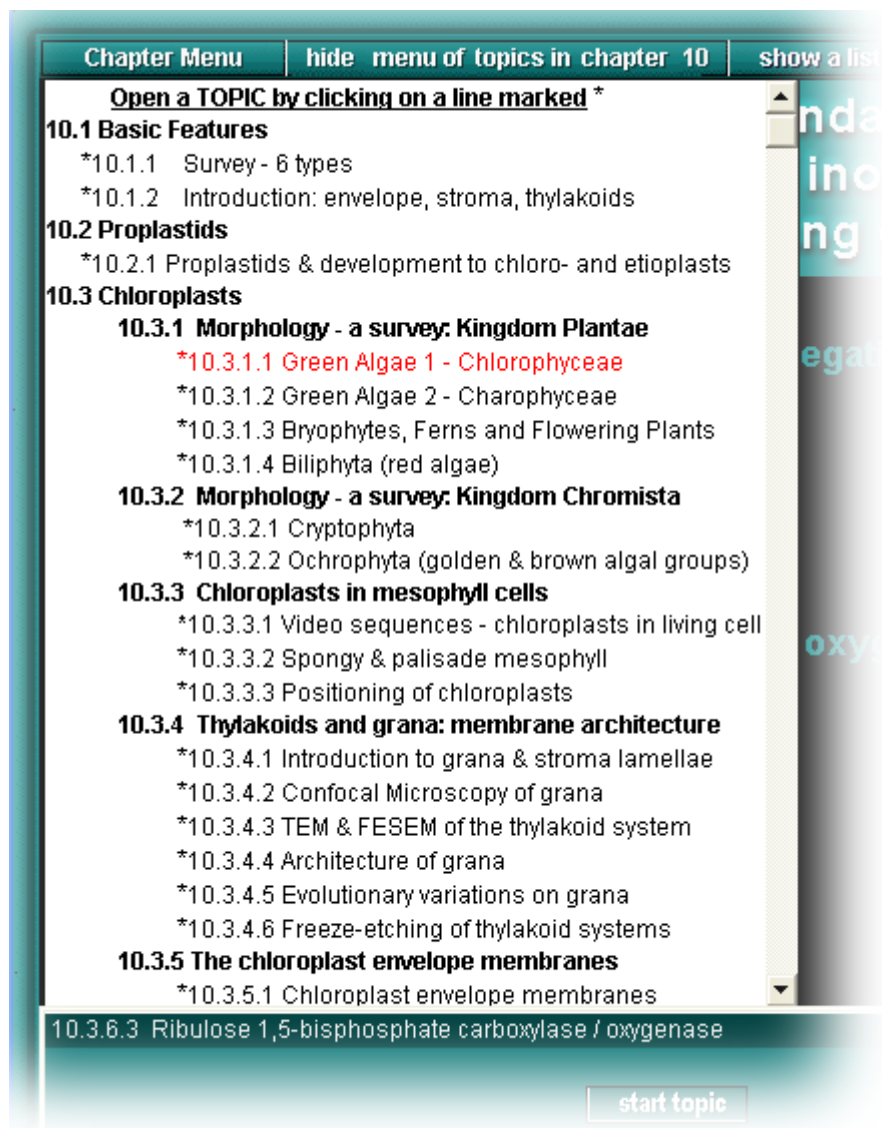
The Main Menu (already used to reach the TOPIC from the opening screen) is available on every TOPIC screen, and can be used to jump to a different CHAPTER or TOPIC. The button toggles between inactive and active states.

show menu of topics in chapter 10



hide menu of topics in chapter 10

This is for navigation within a CHAPTER. Click on it to open a list of TOPICS in the CHAPTER (see example below).



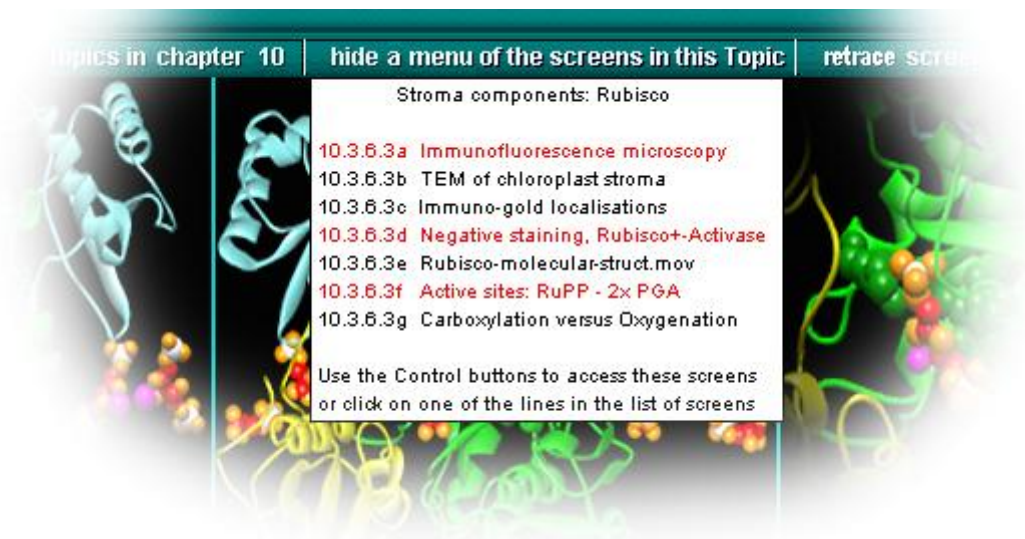
- The list contains lines for sub-headings and for TOPICS. TOPIC lines are marked with asterisks. TOPICS that have been visited in the current session are highlighted in red. A scroll bar and arrows are provided where necessary.
- NOTE: The list is for navigation as well as for recording progress through the CHAPTER - click on any TOPIC line to jump to the opening screen of that TOPIC.

show a menu of the screens in this Topic



hide a menu of the screens in this Topic

This menu button shows (and toggles to hide) a list of the SCREENS within multiple-screen TOPICS, as in the example below, which has a list of 7 SCREENS –



SCREENS that have been visited in the current visit to the TOPIC are highlighted in red. Like the list of TOPICS in the CHAPTER (see above),

This list of SCREENS is also an active drop-down menu. Click on a numbered line in the list to go to a selected SCREENS (or use the buttons on the Control Panel to move among the SCREENS in the TOPIC)

retrace screens

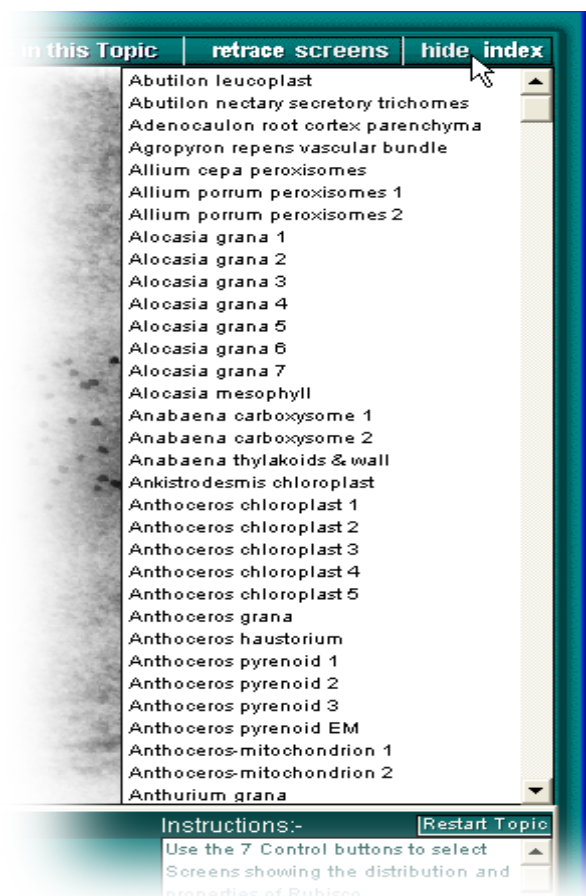
The "Retrace" button is like the "Back" button in Web browsers - it will take you back, SCREEN by SCREEN, through the TOPIC SCREENS that you have visited. If it gets to the end it will loop through the list again.

show index



hide index

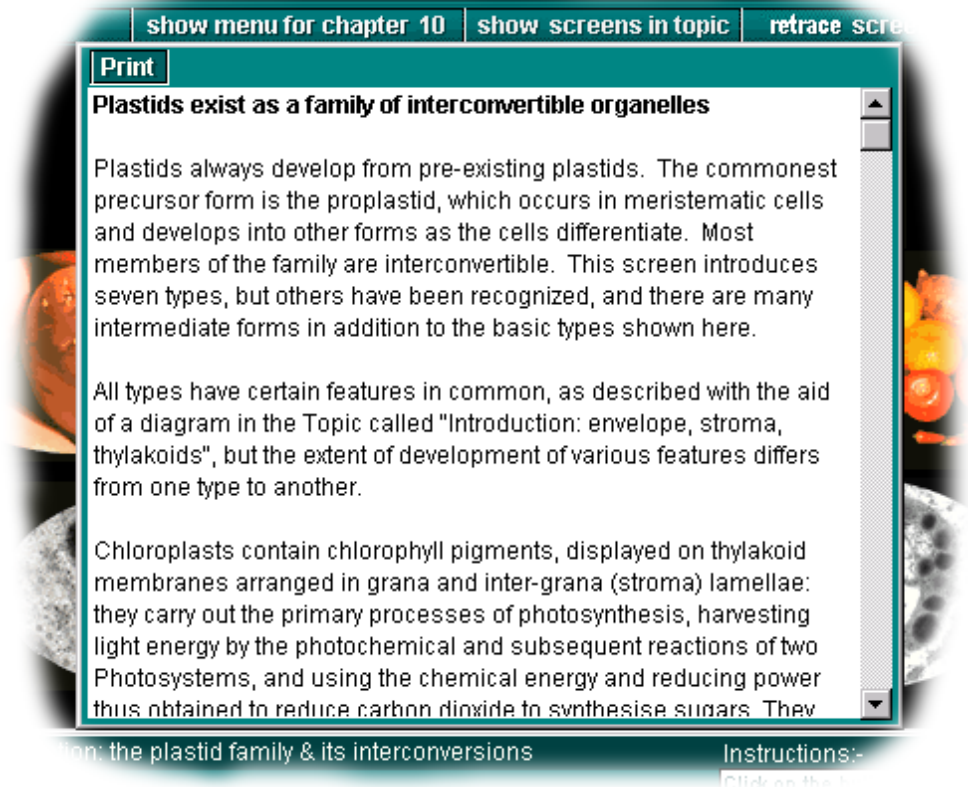
- This button opens a scrollable index of plant names in alphabetical order.
- Click on any item to jump to a SCREEN that illustrates the selected index item.
- note that if you jump out of a TOPIC by using the index, you can use "Retrace" to return to the TOPIC that you left, however, the progress report of red highlights in "Show a list of screens in this topic" will have been erased.
- The button toggles to "hide index" when the Index is showing. Click on this to close the list if you decide not to use it.



show text**hide text**

"Show text" is present on TITLE SCREENS that have associated text. It is highlighted to make it conspicuous because it is present on selected screens only. It opens a scrollable text window and toggles to "Hide text", which is used to close the window.

Click on the "Print" button to print the text on the system printer.

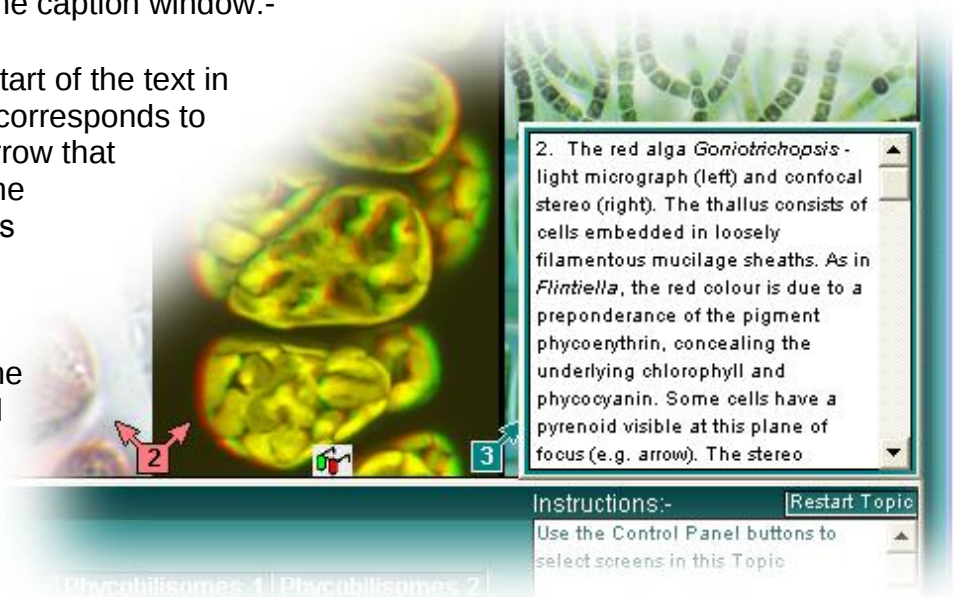
**hide the labels****show the labels**

- This toggle button can be used to clear labels, including caption arrows (see below) from the images (and restore them).

1**3**

Captions: The existence of captions is indicated by the presence of numbered arrows somewhere on the image that is being displayed.

- When the numbered arrows are clicked, the text of the caption appears in a "Labels" window, as in the example below. A repeat click closes the caption window:-
- The number at the start of the text in the caption window corresponds to the number of the arrow that has been clicked. The "active" label arrow is highlighted when its window is open. Clicking on another label arrow closes the one that is open and opens the corresponding new caption.



show ack**hide ack**

This toggle button shows on the lower bar on screens where acknowledgements to published works or donors of images are made.

Click to show - hide acknowledgements.


 **clipboard**

Click on this button to copy the image area to the Clipboard, ready for pasting into another program (use “hide labels” beforehand if the image is required on its own). The captured image is then available to paste into any other program that accepts images (e.g. in Photoshop use Control + N, then the enter key, then Control + V). You can work in other programs without stopping Plant Cell Biology on DVD by using the “Minimize” button (see below).

show help tips**hide help tips**

Click on “show help tips” to activate pop-up explanations for each of the buttons on the screen frame. The pop-ups appear when the mouse pointer is hovered over the buttons. The button toggles to “hide help tips” – click on this to deactivate the pop-up system (the default state is deactivated). Note that the Main Chapter menu accesses a set of HELP SCREENS, in which explanations are selected by means of buttons on the Control Panel. They give most of the information in this manual, including a functional movie with its control bar.



Click on these buttons to Minimize the program to the Taskbar (click on the Taskbar item to restore it), or to go to an exit screen, from which you can either exit or restart the program, or gain access to a credits screen.

record a program ↔ play a pre-recorded program

These buttons are for (a) recording a selected sequence of screens so that they can be viewed as a “slide-show” at a later date, and (b) playing a pre-recorded sequence as a “slide-show”.

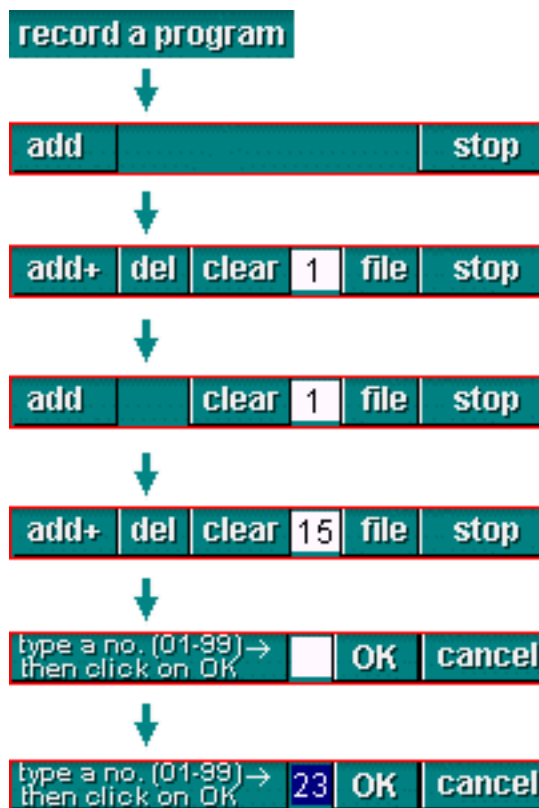
• Recording a sequence:-

Navigate to the first screen of the sequence that is to be recorded and click on “record a program”. The button changes as shown. Now click “add” to insert the screen into the program. The “stop” button cancels recording.

Having entered a screen you can now change your mind and delete it (“del”), or add another copy (“add+”) (repetitions would usually be added later in the program – when you see “add+” you know that a copy is already present), or you can clear the program (“clear”) or file the program (“file”). Normally you would want to add other screens before filing.

When you navigate to the next screen in your sequence “add+” changes to “add” (provided that screen has not previously been entered) and “del” disappears. Continue navigating and adding screens until you have completed the program. NOTE: The “add+” and “del” buttons appear whenever you are at a screen that is already in your selection. If you have >1 copy of a screen in the selection, “del” removes the latest entry first.

Click “file” to save the sequence to disc. The filename is always “PCB-program” followed immediately by two numerals which you choose by entering them into the box to the right of the arrow. You must enter two numerals. Non-numerals will be rejected. The file extension is “.txt”. The “cancel” button aborts the filing process and allows you to continue programming or to rename the file, if necessary.



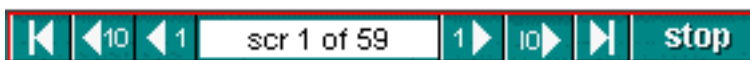
Finally, click “OK”. A Windows “save” dialogue box appears. Navigate to the folder where you want to store your programs. Any existing “PCB-program???.txt” files are listed. Click the “save” button to write your new program to disc. You will be warned if you are about to overwrite an existing file (if you do NOT want to overwrite a file you must click on “no” in the warning box, then click “cancel” in the Windows dialogue, then, back in “Plant Cell Biology on DVD”, enter new numeral(s) and once again click “OK”. Altering the filename in the Windows dialogue box will have no effect.

• Playing a pre-recorded sequence:-

First select the “PCB-program???.txt” file that you want to use (sample files are provided, see p12). To do this -

play a pre-recorded program

Click on “play a pre-recorded program”. A Windows dialogue box listing the available files opens. If necessary, navigate to the folder where you store your programs. Click on the file you wish to open and then click “open” in the Windows dialogue. The “play a pre-recorded program” button changes as shown and the first screen of the program is opened.



Now run the program:- At the start you are given the message that you are at screen 1 of the total number of screens in the program. The arrows with the bars take you to the beginning or the end of the program; the other arrows go back or forward by one or ten screen in the sequence. You are always told where you are in the program. The “stop” button aborts the program.

NOTE: Even though you may be playing a program, you can digress at any time by using the normal navigation controls. They are all available, including “retrace screens”, which retraces program screens just as for any others. And after a digression you can revert to the program simply by clicking one of the arrow buttons.

On-screen controls

Additional control buttons and symbols are used on some screens (the buttons shown below are just examples – the actual images, and the wording, vary. Check the “Instructions” in the Control Panel:-

- (i) 

- Click to **show - hide the specified image**

- (ii) 

- Click to start **panning**; click anywhere on screen to interrupt panning.

- (iii) **Click & drag image** 

- Some images are larger than the viewing window. Left click – hold down and drag in the direction of the arrows to bring hidden parts into view.

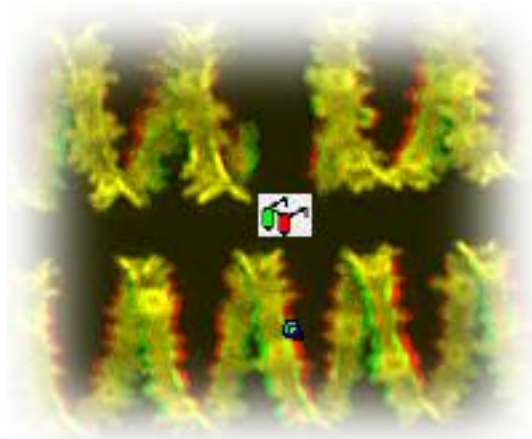
- (iv) The **animation / video controller** has four elements.

- 1 is the start arrowhead (most of the sequences start playing (and loop) as soon as the screen is opened, so a pause symbol is present at the left end of the controller bar). After pausing the movie, each click on the start arrowhead plays the sequence once.
- 2 is the slider, which moves along the slider bar as the sequence plays. Pause the movie, then Click and hold and drag the slider to play the sequence manually, in either direction.
- 3 and 4 are for advancing or reversing the sequence by single frames (when the movie is paused); in many of the animations several clicks may be needed to move a frame visibly.



NOTE: the appearance and functionality of the Controller Bar differs according to which version of QuickTime is installed. 3 and 4 (above) may not work in all cases.

- (v) The **red-green glasses symbol** indicates that the image is a red-green anaglyph stereo, and that it should be viewed with red-green glasses, placing the red filter over the left eye.



The Control Panel

The Control Panel provides buttons and instructions for navigating among SCREENS within multi-screen TOPICS. It occupies a horizontal strip across the bottom of the screen. Its components are:-



1 The title of the TOPIC. The number (starting with the chapter number) corresponds to numbers in the lists that open when "show menu for chapter ??" and "show screens in topic" are clicked.

2 These buttons access the various screens in the TOPIC. Often they are arranged in a set of SUB-TOPIC buttons at the left, with buttons for individual SCREENS (within the sub-topics) in the centre. Note that the buttons that are currently in use are darkened.

3 The "restart topic" button jumps back to the opening TITLE SCREEN of the TOPIC. It is not present in the title screen itself.

4 This text panel gives instructions specific to individual SCREENS and TOPICS.

A Guided Tour of the “Plant Cell Biology on DVD” User Interface

After the setup program has finished installing “Plant Cell Biology on DVD”, take the following tour to become acquainted with the user interface .

(NOTE: Chapter 1 (Help Screens) contains instructions for using all of the controls in the user interface.)

1. Open the Program:

- 1.1. Go to the Windows Start button, then Programs, then Plant Cell Biology on DVD, then PCB on DVD, **click** (left clicks are used throughout)
- 1.2. The opening screen has two buttons. They both open the program – the one at lower centre does so directly, the one at lower right does so via the Licence Agreement (if you reject it the program exits). You will then see a screen with a list of Chapters and “How to enter” instructions.

2. Select a Chapter and Topic:

- 2.1. As instructed on-screen, **move** the mouse cursor up and down the list of available chapters at the left side, noting how each becomes highlighted, and how sub-menus “fly out” to the right of the chapter list;
- 2.2. For the purposes of this guided tour, **pause** the cursor on chapter 10, Plastids
- 2.3. **Move** the cursor rightwards into the sub-menu and then upwards to highlight sub-menu item “Chloroplasts”;
- 2.4. **Move** the cursor to the right again into another sub-menu; highlight “Morphology – a survey 1. Kingdom Plantae”;
- 2.5. **Move** the cursor right once more into the final sub-menu and highlight the topmost item “Green plants 1...”; note that the highlight colour is now red-brown, signifying that a Topic that can be opened by clicking has been reached. There is also a number in the lower right corner of the menu item, indicating how many screens there are in that Topic. **Click** to proceed to the Topic “Green plants 1...”.

3. The Opening Screen of a Topic:

- 3.1. All such opening screens show a heading and a brief outline of the Topic’s contents. The lower part of the screen now contains a “Control Panel” with context-sensitive instructions, the decimal notation of the Topic (beginning with the chapter number), and a single button - “Start Topic”. **Click** on this button to get into the Topic.

4. Within a Topic (a) the image area:

- 4.1. An image is now present above the Control Panel. In this case the image is composite, so there are several caption icons – these are square and numbered, each with an arrow. **Click** on caption icon number 1. The caption window opens, with scrollable text giving information about the corresponding image; note that the active caption icon is now highlighted;
- 4.2. **Click** on caption number 3 – the appropriate caption text replaces the previous text and the highlight moves to icon 3;
- 4.3. **Click** again on the highlighted caption icon 3; the text window closes and the caption highlight is turned off;
- 4.4. **Click** on other caption icons – each click opens a new text; re-clicking an open caption icon turns it off;
- 4.5. There is one other symbol on this particular screen, depicting a pair of red-green spectacles. This signifies that the images near the symbol are in anaglyph stereo and should be viewed with red-green stereo glasses.

5. Within a Topic (b) the Control Panel:

- 5.1. The Control Panel at the lower part of the screen is now more complex than it was on the opening screen of the Topic. It now carries a set of buttons for opening the remaining screens in the Topic, new and appropriate Instructions, and (far right) a “Restart Topic” button. This is the standard set of functions, but the screen buttons and instructions vary from screen to screen and Topic to Topic;
- 5.2. **Click** on “Restart Topic”. The program returns to the opening screen. **Click** on “Start Topic” to get back again;

*

Apple Quicktime® must be present. If it is not already available, please obtain and install it from www.apple.com (free download) before proceeding further. If a video projector is being used, the screen can be filled by adjusting the screen resolution to 800x600 pixels.

- 5.3. In this particular case, some of the Control Panel buttons open animations on this same screen – **click** on the buttons numbered 1,2,3,4 to see how they work;
- 5.4. In the great majority of cases clicking on Control Panel buttons opens new screens; as an example, **click** on the button “Ulvophyceae” to go to that screen. It will open with a confocal microscope animation already playing, together with still images (some in stereo);
- 5.5. Note that as you move from screen to screen by clicking Control Panel buttons, the appropriate button is highlighted in blue to indicate where you are. In this case clicking the “Ulvophyceae” button opened a new set of buttons (in the centre of the Control Panel), and the highlighting shows that you are viewing Ulvophyceae – *Ulothrix*;
- 5.6. **Click** on “Stigeoclonium” to go to Ulvophyceae – *Stigeoclonium*. Often Control Panel buttons are arranged with a set of buttons for sub-topics at far left and buttons for opening individual screens within the sub-topics in the centre.

6. Within a Topic (c) buttons along the Upper Frame:

- 6.1. *Chapter Menu*: this button (at upper left) is available on every screen in case you want to move to a different chapter. Its use is exactly as described in section 2 of this tour; for the moment just **click** on the button to open the drop-down list of chapters, see that it works as before by rolling the cursor over it, then **click** anywhere *outside* the drop-down list to close it again;
- 6.2. *Show Menu of Topics in Chapter x*: this is the next button along the upper frame. Currently x = 10 but if you were in a different chapter the number would be the appropriate one. **Click** on the button. A scrollable list of Topics in Chapter 10 drops down. The Topics are exactly as in the Chapter menu, but here their decimal notation is shown, also the Topics that have been visited in the session are highlighted red (in this case there is only one such – 10.3.1.1 Green algae 1 Chlorophyceae). You could (but for the moment do not) close the drop-down list by clicking on the button again (note that when the list is open the button toggles to “Hide Topics in Chapter 10”)
- 6.3. This is not just a list of available Topics, but an active menu. Any line marked by an asterisk can be clicked. Scroll down the list and **click** on 10.4.1 Prolamellar bodies; you are immediately taken to the opening screen of that Topic;
- 6.4. *Show a menu of the screens in this Topic*: this is the next button on the upper frame; **click** on it: the button now says “hide...”. A list of screens in the Topic drops down, with decimal notation starting with the Chapter number. Screens that have been visited are highlighted in red. This display can be used to check whether you have seen everything that is available in the current Topic. This is more than just a list for progress monitoring: it is also an active Menu: you can click on any numbered screen to jump to that screen. **Click** on the button again to close the list;
- 6.5. *Retrace screens*: for the moment, do not further explore the Topic to which you have just jumped, instead return to where you were by **clicking** on the upper frame button “Retrace screens”. This functions like the “Back” button in web browsers. It allows users to retrace their path through the screens that have been visited. Up to 100 screens are retained in memory. Click until you get back to “Ulvophyceae – *Stigeoclonium*”;
- 6.6. *Show index*: this is the remaining button on the upper frame. **Click** on it to drop down a scrollable list of the names of plants that have been used for the illustrations throughout the entire program. As an example, **click** on the item, “*Abutilon* nectary secretory trichomes” to see that the list is active.

7. Practice some of these navigation procedures:

- 7.1. open the Chapter menu, select Chapter 2 (Introduction to Plant Cells);
- 7.2. select sub-menu “Introduction to Cell Components”, then Topic “TEM - general views”; **click**;
- 7.3. in the opening screen **click** “Start Topic”;
- 7.4. **click** on the button “Selected views 3” (right-most of the Control Panel buttons);
- 7.5. **click** to see that “Show Menu of Topics in Chapter 2” (upper frame) has changed to show the Topic list for Chapter 2; **click** again to close the list;
- 7.6. **click** “Show a menu of the screens in this Topic” – it should show the first and last lines in red;
- 7.7. **click** on a numbered line to jump to that screen.

8. Within a Topic (d) buttons along the Lower Frame:

- 8.1. *Show/hide labels*: the screen that is showing when section 7 has been completed has numerous labels. These can be hidden, e.g. if a tutor wants to have a quiz, or if a user wants to screen-capture the image in an un-labelled state. **Click** on the left-most of the buttons on the lower frame (“Hide labels”). The labels disappear; **click** on the button again to restore them;
- 8.2. *Show/hide text*: in the current screen there is a blank space alongside “Hide labels”. To see the button that sometimes occupies this space it is necessary to navigate to a screen that has accompanying text. **Click** on the chapter menu (upper frame) and **click** on chapter 11 – Peroxisomes – Topic “Peroxisomes – structure, function, proliferation”. An example of an opening

screen with associated text is now showing. **Click** on “show text” (lower frame, second from left). A text window opens; scrolling to the bottom reveals a “further reading” list. At the top of the window there is a “print” button. Clicking on this outputs the text to a default printer, provided that one is installed on the PC; **click** on the lower frame button (which has now toggled to “Hide text”) again to close the text window. Most of the text entries are associated with opening screens of Topics. The Contents document that has been installed in the Windows start menu lists the screens that have associated text;

- 8.3. *Show/hide ack*: the next two buttons on the lower frame (recording and playing programs) are described separately; skip them for now. **Click** “Start Topic” and **click** button 8 in the Control Panel to go to an example of a screen that requires an acknowledgement. In this case it is a pair of FESEM images that have been donated for use in “Plant Cell Biology on DVD”. In such cases a “show ack” button appears in the lower frame. **Click** it to open the citation; **click** again to close it.
- 8.4. *Clipboard* Click this button to export the contents of the image area to the Windows clipboard (you may want to use the “hide labels” button first). The captured image is then available to paste into any other programme that accepts images (e.g. in Photoshop use Control + N, then the enter key, then Control + V). You can minimise “Plant Cell Biology on DVD” by using the “Minimize” button (see below).
- 8.5. *Show/hide help tips*: the next button is “show help tips”. This is its “off” state. **Click** it to turn its function on. Now place the mouse cursor on any frame button – a brief description of the selected button “pops up” until the cursor is moved away. This function is not required unless users are unfamiliar with the buttons, so unless the help tips are considered useful it is best to turn it off. **Click** the button (which now says “hide help tips”) again;
- 8.6. *Minimize and Exit*:: these standard symbols are at far right on the lower frame. *Minimize* reduces the program to an item on the Taskbar, which is useful if you have captured an image to the clipboard and want to paste it into another program. Click the Taskbar item to restore Plant Cell Biology on DVD. The *Exit* button starts the exit process. **Click** on it. You are taken first to a screen that offers “Restart”, “Credits” or “Exit” (in red). At this point you can choose to re-start the program. **Click** “Exit” to close the program.

9. Movies:

- 9.1. If you have closed the program in 8.6, re-open it and navigate to a sample movie: in the Chapter menu select chapter 1 (Help screens) and then **click** on “Viewing images” in the sub-menu, then “Viewing video/animations” in the Control Panel.
- 9.2. This particular movie is already playing when you open the screen (as you have already experienced during tour items 5.4 and 8.3). To pause the movie **click** on the pause symbol (two vertical lines) when the movie is playing; to start the movie **click** on the arrowhead at the left end of the controller bar below the movie window.
- 9.3. While the movie is paused **click** on the left and right arrowheads at the right-hand end of the controller bar: each click sends the movie forwards or backwards one frame at a time.
- 9.4. Whether the movie is playing or paused, you can **click-hold** on the moving slider and drag it to left or right to move quickly to any desired part of the movie.

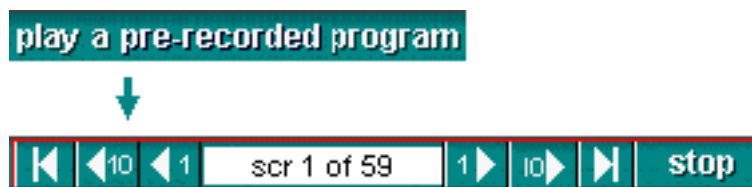
NOTE – Some versions of Quicktime do not show the Controller Bar in 64-bit computers (XP-64, Vista-64) Use the most recent versions

10. On-screen Controls:

- 10.1. Use the Chapter menu to navigate to Plastids – Chloroplasts – Thylakoids and Grana – Electron microscopy of the Thylakoid System; **click**; also **click** on “Start topic”;
- 10.2. The screen now showing is an example of one that has an on-screen control button. This one is for panning the image. Other examples open animations or open additional images to illustrate some further aspect of the image or diagram that is on the screen. **Click** the on-screen button “Click here to pan the image” and after observing the result follow the new on-screen instruction by **clicking** anywhere on the moving image;
- 10.3. Now **click** the Control Panel button “Zea 4 TEM” to see a different on-screen control. This image is larger than the image window. **Click-hold-drag** anywhere on the image to move its hidden portions into view.

11. How to Play a pre-recorded Program Sequence as a Slide-show:

- 11.1. The PCB installer places sample pre-recorded programs into the Windows folder that contains the main PCB.exe file (and its sub-



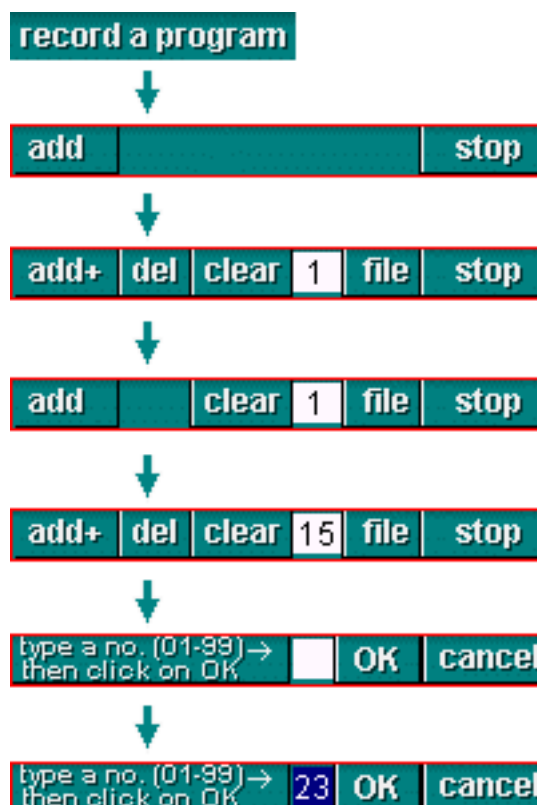
folder of quicktime movies). Those numbered 01 -14 contain the screen-by-screen contents of Chapters 1-14; PCB-Program99.txt shows *all* screens, and numbers 50, 51,52 and 60 are sample collections. To select a pre-recorded program **click** on "Play a pre-recorded program" in the lower frame;

- 11.2. A Windows dialog box opens. With most Windows versions it will already be at the appropriate folder, i.e. the one that holds the Plant Cell Biology program itself. If you used the defaults when installing the program, this will be C:\Program files\PCB on DVD. If you specified some other folder you may have to navigate to it. The pre-recorded programs are all called "PCB-Program??.txt", where "??" is a two-digit number from 01 to 99. Select PCB-Program 09.txt and **click** the "open" button. With some versions of Windows you may have to click on a confirmation dialog box;
- 11.3. The lower frame now carries controls for playing the pre-recorded sequence of screens. PCB-Program09.txt holds all screens in Chapter 9 (Mitochondria), and the system has jumped to the first screen of the collection, namely the opening screen of the first Topic in the Mitochondria chapter (note the message "scr 1 of the total number in the program"). Now you can go forwards or backwards through the screens, either 1 at a time or 10 at a time, or jump to the last or the first in the sequence, by using the six arrowed buttons to right and left of the message. The message will always show where you are in the sequence. **Click** on the six arrowed buttons to see how they work. Note that all of the other frame buttons remain active while you are playing the program, so you can digress from the program as much as you wish, or open captions and texts (etc);
- 11.4. To exit the pre-recorded program **click** on the "stop" button.

NOTE: One use for pre-recorded programs is for one-click display of images during presentations. Another is for class exercises, for example if Plant Cell Biology on DVD is installed on a server, students working at terminals can be asked to review a particular subject by providing them with a suitable PCB-Program??.txt file (see page 16 for a list of PCB-Program files provided as examples).

12 How to Record a Sequence for Subsequent Use as a Slide-show:

- 12.1 A teacher/tutor/lecturer does not want to use time-consuming navigation procedures to find the next image during a presentation. The program recorder allows pre-selected sequences to be filed on disc and called up when needed for one-click presentation as described above;



- 12.2 Navigate to the first screen of the sequence that is to be recorded and **click** on "record a program". The button changes as shown. **Click** "add" to insert the current screen into the new program that is being recorded. The "stop" button cancels recording;
- 12.3 Having entered a screen you can change your mind and delete it (**click** "del"), or add another copy (**click** "add+") (repetitions would usually be added later in the program – when you see "add+" you know that a copy is already present), or you can clear the program (**click** "clear") or file the program (**click** "file"). Normally you would add other screens before filing;

- 12.4 When you navigate to the next screen that is to be added to your sequence “add+” changes to “add” (provided that screen has not previously been entered) and “del” disappears. Continue navigating and adding screens as in 12.1 until you have completed your program. NOTE: The “add+” and “del” buttons appear whenever you are at a screen that is already in your selection. If you have >1 copy of a screen in the selection, “del” removes the latest entry first;
- 12.5 **Click** “file” to save the sequence to disc. The filename is always “PCB-program” followed immediately by two numerals which you choose by entering them into the box to the right of the arrow. You must **enter** two numerals. Non-numerals will be rejected. The file extension is “.txt” (added automatically). The “cancel” button aborts the filing process and allows you to continue programming or to rename the file, if necessary;
- 12.6 Finally, **click** “OK”. A Windows “save” dialogue box appears. Navigate to any folder where you want to store your files. Any existing “PCB-program?? .txt” files are listed. **Click** the “save” button to write your new program to disc. You will be warned if you are about to overwrite an existing file (if you do NOT want to overwrite a file you must click on “no” *in the warning box*, then click “cancel” *in the Windows dialogue*, then, back in “Plant Cell Biology on DVD”, enter new numeral(s) and once again click “OK”. *Altering the filename in the Windows dialogue box will have no effect.*

Sample Program Files

Several sample PCB-Program**.txt files are provided with **Plant Cell Biology on DVD**. The installer places them in the same folder as the main program (C:\PCB on DVD is the default location). They can be accessed by clicking the “Play a Pre-recorded Program” button.

Their contents are as follows:-

Chapter Contents:

PCB-Program01.txt	All screens in Chapter 1 (Help Screens)
PCB-Program02.txt	All screens in Chapter 2 (Introduction to Plant Cells)
PCB-Program03.txt	All screens in Chapter 3 (Nucleus)
PCB-Program04.txt	All screens in Chapter 4 (Endoplasmic Reticulum)
PCB-Program05.txt	All screens in Chapter 5 (Golgi Apparatus)
PCB-Program06.txt	All screens in Chapter 6 (Plasma membrane)
PCB-Program07.txt	All screens in Chapter 7 (Plasmodesmata)
PCB-Program08.txt	All screens in Chapter 8 (Vacuoles)
PCB-Program09.txt	All screens in Chapter 9 (Mitochondria)
PCB-Program10.txt	All screens in Chapter 10 (Plastids)
PCB-Program11.txt	All screens in Chapter 11 (Peroxisomes)
PCB-Program12.txt	All screens in Chapter 12 (Cytoskeleton)
PCB-Program13.txt	All screens in Chapter 13 (Trafficking)
PCB-Program14.txt	All screens in Chapter 14 (Positional Interactions)

Sample Collections:

PCB-Program50.txt	Examples of movements in living cells (movies)
PCB-Program51.txt	A survey of chloroplast biology
PCB-Program52.txt	A screen survey of different kinds of plastid
PCB-Program60.txt	A sample collection from throughout the DVD