A asic re ise o the eodiversity conce t reco ni es that there is an intrinsic re ationshi etween io o ica diversity and eo o ica diversity n rinci e, the eo o ic edroc is viewed as the o nda tion o the ecosyste Geo o ic reso rces and rocesses s stain ch reater re a tionshi s with iotic reso rces and iosys te s than is co on y reco ni ed hese re ationshi s are inte rated at the ecosys te , co nity, s ecies, or ae h tcies we i rvatii e

nderstandin o e tinction re ains i ited Certain y ass e tinctions, which transcend ta o no ic o ndaries, are so ehow in ed to ar e sca e chan e in a i otic reso rces

eciation. st as iodiver sity is de endent on eodiversi ty, iodiversity is a nction o enetic diversity estions er tainin to syste atics and evo tion are ty ica y etter addressed y way o a eonto o ica re so rces than y odern s ecies he ossi record contains an a ndance o evidence to derive hy o enetic re ationshi s and evo tionary trends a

ri in of life. he ada ta i ity o i e is we de onstrated in the eother a oo s o e owstone ationa ar Cyano acteria thrive within the hi h te erat re, inera rich hot s rin s, de on stratin an interestin e a e o a c ose re ationshi etween iotic and a iotic reso rces he e istence o hi h te era t re cyano acteria in e owstone hot s rin s is considered i ortant in research associated with the ori in o i e on earth and the e istence o i e on other anets eysen ach, in ress

arl biodi ersit diacara fauna. ne o the ost interestin and i ortant a eonto o ica discoveries occ rred in a series o very o d roc s in the Ediacara Hi s o A stra ia c ena in ine rained reca rian sedi entary roc s, de osited in a ow ener y environ ent, reserve ea ti and de icate re ains o so t odied or anis s i re hese rare and n s a i e or s rovide an e ce tiona view o ear y iodiversity on earth

he rich Ediacaran a na overt rned the on he d isconce tion that io o ica diversity d rin the reca rian was ow n act, since the discovery at Ediacara, ie dwor in reca rian roc s has yie ded n ero s other oca ities aro nd the wor d reservin these ysterio s so t odied or anis s e eri ents in the ear y evo tion o i e

a brian e losion. he e innin o the a eo oic, re erred to as the Ca rian, is de ined y the a ost s dden, wor dwide e osion o i e or s, in ter s o oth diversity and a ndance his er ceived iotic e osion is ore direct y tied to the che ica evo tion o the at os here

with s icient concentrations o o y en avai a e or or anis s to reci itate ca ci car onate e os e etons ver the ast i ion years, i e has contin ed to evo ve, diversi y, and eco e inte rated into co nities and ecosyste s

late tectonics continental drift. odern eo o ic theory is ased on an nderstandin that the Earth s cr st con sists o ates hese ates are dyna ic and o i e Geo o ists e ieve that the conti nenta and asses o today were once art o a sin e and ass re erred to as *Pangaea.* he distri tion o identica ossi enera ro er ian roc nits, e osed across o r wide y se arated continents, rovides stron evidence or the ori ina ro i ity o these or anis s and and asses

Mountain buildin oro en . he eo ra hic ran e and i ration ro tes o s ecies can e de ined y eo o ic and eo or hic eat res he i t o o ntain chains, deve o ent o canyons, and e ansion o a es are e a es o eo o ic rocesses which ay in ence the distri tion and ove ent o iotic reso rces

isitors to Grand Canyon ationa ar ay earn a o t the story o the tasse eared s irre s he Abert s s irre and ai a s irre are e ieved to e descen dents o a co on ancestor With the deve o ent o the Grand Canyon, two o a tions o the s irre were eo ra hica y iso ated Even t a y the iso ated o ations evo ved into distinct ta a Figure

ea le el c an es. he eo o ic record reserves a ndant evidence o chan es in wor dwide sea eve rans ressive and re ressive se ences, re resentin e static sea eve chan es, nct ate the a eo oic era rin the Cretaceo s eriod, a sha ow in and sea e tended ro the G o e ico to the Arctic ean his Creta ceo s sea e isted or i ions o years, eo ra hica y iso atin o ations o terres tria ants and ani a s

ontinental laciation. o r cyc es o acia advance and retreat are doc ented d rin the eistocene Continenta ice sheets e anded and withdrew in northern atit des rin eriods o acia advance, a wor dwide dro in sea eve was e eri enced he dro in sea eve , co ined with the e anded ice sheet, res ted in a direct connection etween A as a and ssia, re erred to as the *Bering Land Bridge.*

Me afaunal i ration. Chan es in sea eve , e ansion o continenta ice sheets, and the deve o ent o and rid es ena ed terrestria s ecies to i rate into ad acent and asses rin the eisto cene, ar e a a s and h ans were a e to i rate across the erin and rid e n t rn, these a a s ca e into direct co etition with e istin s ecies

leistocene ca e de osits. eistocene Ho ocene c i ate chan es can e doc

Figure 3. An example of geomorphically induced reproductive isolation: the distinctive Abert's (A) and Kaibab (b) squirrel. ***Photo courtesy of the author***

ented thro h ana ysis o ac rat id dens and ossi i ero s cave de osits an t cci et a n c assic st dies nder ta en y the a eonto o ist ohn G i day, ossi rich se ences o eistocene strata were e cavated ro sin ho es and caves o the A a achian states G i day and Ha i ton he strati ied cave sedi ents yie ded ossi a a re ains a ter natin etween so thern war weather s ecies and northern co d weather s ecies hro h inde endent ines o evidence, it was deter ined that this iostrati ra hic attern was d e to the dis ace ent so th o the northern orea s ecies d rin acia advance, and the ret rn o the so thern te erate s ecies d rin acia retreat

reat ok M ountains refu ia. Great o y o ntains ationa ar is renowned or its rich iodiversity his act has een con ir ed thro h co rehen sive io o ica reso rce inventories in recent years art o the historic io o ica story at the ar is tied to the e ansion o the continenta ice sheets d rin the eistocene rin acia advance, the ore northern orea and te erate s e cies were shed so th and were event a y esta ished the se ves within eistocene re ia in the so thern A a achians

e D o

n consideration o this eodiverse er s ective, erha s it is worth re ectin on Char es arwin s contri tions to nat ra science arwin ro osed new ideas t orth in *On the Origin of Species* and other ications ased on o servations and data acc ated on a o a sca e ver the ast ha cent ry, nat ra science has shi ted its oc s in ed cation, research, and ndin away ro the arwin sty e i ict re a roach, to an e hasis on the ce ar, enetic, and o ec ar eve s o io o y

n estiona y, we have ene ited ro the scienti ic nderstandin s ained thro h this icrosco ic and s icro sco ic trend in nat ra science However, the cost has een a di inished a i ity or any scho ars and st dents to ta e on the tidisci inary, i ict re estions n t rn, we have i rated toward anthro ocentric and iocentric strate ies or nat ra science

dds are that one wo d ore i e y rec

or : Co ia niversity ress
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